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Issue 6 • Dec 17, 1988

NEW COMPUTER EXPRESS

First news, first reviews – every week

ThunderBlade

How Mr X took just 320 seconds to break into this top-selling game

The shady world of the software crackers – page 46

100 PRIZES worth over **£2500** in our incredible, easy-to-enter Christmas competition – page 8-9

WIN!

- A complete Atari ST system
- A Commodore 64 system
- Sega and Atari games consoles
- 12 Konix joysticks
- Stunning games from Ocean, US Gold, Mediagenic, Infogrames and Melbourne House

ATARI SC1224

News and reviews for YOUR machine – pp 52-59

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- Atari ST
- BBC
- C64
- CPC
- MSX
- PC
- PCW
- QL
- Spectrum

COMPUTER SALES EXPLODE

Shops sell out as Christmas mania hits the high-street – full story page 2

ROGER RABBIT

We check out the game with the unbelievable graphics – page 35.

A CAREER IN COMPUTING?

- Our guide to the options begins p19
- Three pages of job ads pages 23-25

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BOOM!

Computer mania hits the High-Street

"The best Christmas since 1983"

The computer bug is afflicting thousands of new users this Christmas, with hardware manufacturers and shops struggling to keep up with demand. Some machines are now impossible to buy.

Amstrad has already run out of supplies of the Spectrum +2 and it's unlikely that any more will be appearing until after the seasonal rush is over. Commodore is frantically trying to ship in more of its C64 Hollywood Packs after distributors ran dry mid-way through last week.

And the rush isn't restricted to sub £150 computers. As expected, the ST and Amiga are being scooped up. Commodore and Atari though appear to have been ready for the 16-bit boom with stocks in a healthy state.

Don Carter, boss of micro distributor ZCL told *Express:* "This has been the best Christmas since the boom of 1983. It's absolutely phenomenal. Sales have far outstripped everybody's expectations in the sub-£150 area."

Major computer store Bits and Bytes in Liverpool ordered 600 Commodore 64s at the beginning of last week but isn't confident of them lasting long. "Every lunchtime and evening we have queues outside waiting to buy machines," enthused joint boss Trisha Steadman. "We've sold 30 per cent more already than we did by the end of last Christmas..."

At week's end this was the position on the main contenders for families' Christmas cash.

Spectrum +2: High Street chain store Dixons sold out last week, and is reported to have placed a massive 50,000 unit order with Amstrad which simply could not be fulfilled. "If you find a Plus 2 in a Dixons you'll be very lucky" said one branch manager.

For suppliers Amstrad, marketing manager Anthony Sethill said: "Demand for this machine has been much better than even we anticipated, it's been fantastic. We'll be trying to fulfill demand as soon as possible." He declined to comment on Dixons' alleged unfulfilled order and was unable to give a date for new shipments of the machine. Dixons' headquarters refused also point blank to discuss the matter.

The +2 sales come despite criticisms that the expansion socket on the latest version of the machine is incompatible with earlier models.

Spectrum +3: With the +2 such a rarity, sales of the disk based machine are taking off. Previously, the +3 has never even come close to its older brother in popularity, but now sales are said to have mushroomed.

Commodore 64: "We've been planning Christmas for months," said a Commodore spokesman, "but it's disconcerting that a machine as old as the C64 should be doing so well for a go-ahead computer company such as us."

Don Carter of ZCL said he was "hopeful" that Commodore would be delivering a new batch of the machines next week. He claimed to be selling 700 C64s per day to dealers.

Atari ST: London retail chain Silica Shop said it was "having difficulty keeping up" with orders for the ST. "The shops are absolutely packed. People are beginning to see that the computer is a good buy."

Atari itself has long heralded this as the year for the ST with total numbers of the machines in the UK expected to reach 200,000 by the end of the year. The £399 Super ST which includes an impressive bundle of games is outselling the basic £299 model

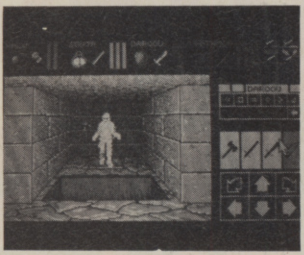
Commodore Amiga: Commodore has filled its distribution centre in Peterborough in order to avoid any danger of stocks drying up. "We made very ambitious predictions for this Christmas and I think we're going to exceed them by 30 per cent," offered a spokesman. "I reckon we're going to sell more than 50,000 this season," he said.

"Amiga sales have hit the roof," said one distributor.

Good bundling deals and "sensible pricing" have been cited as reasons for this year's bonanza. "There's a great deal of disposable income around this Christmas," reasoned Carter. "And £150 really isn't a lot of money to pay for a computer. The hardware manufacturers have put together attractive packs."

• Spectrum +2: Vanished from the shelves

Amiga Master



• An Amiga version of classic adventure *Dungeon Master* is now available in the UK. However, only Amiga owners with 1Megabyte upgrades will be able to play the game. It's priced at just under £35 from Gainstar. *More details on 0252 877431.*

GLOOM!

Jobs go as disk drive manufacturer dips out

Employees of Newbury Data in Winford face the looming threat of job losses with the firm closing down its disk drive manufacturing arm.

A buyer for the operation is currently being sought but many disk drive manufacturers are already facing serious problems. Newbury was forced to close down the wing following its acquisition by the FKI Group. The latter had stated its intent to leave the disk drive market as long ago as last spring.

Newbury Data continues to manufacture VDUs and printers and has yet to announce the number of jobs lost. But workers could learn the bad news before Christmas.

"Generally the market has been facing difficulties," commented Newbury's Claire Jarvis. "We're expanding on the printer and VDU side but FKI didn't want to stay with disk drives."

Jarvis preferred not to comment on how negotiations to sell the business were going or how many jobs would be lost.

● *Amstrad's entrepreneurial boss Alan Sugar has been made an Honorary Doctor of Science at the City University in London.*

Sugar – who left school at 17 to pursue his business career – established close contacts with the University last year after giving a series of business lectures. During these talks, Sugar advised the budding business giants to avoid journalists, Americans and everything else that doesn't represent a healthy mark up.

He also founded the Amstrad Research Scholarship for innovative students, tutored other students on the development of new products and has invited graduates to join Amstrad.

Sugar has lately become more of a public figure with innumerable newspaper profiles, the 'Europe open for business' TV ads and even an interview with Terry Wogan on television. This move into the establishment though is not said to have cooled his reputed hot temper.

Boxing clever: The all-in-one Z88

CAMBRIDGE Z88
THE COMPUTER FOR PEOPLE ON THE MOVE
Z88
Z88
Z88
User Manual

Sir Clive Sinclair's Cambridge Computer has come up with an all-in-one kit for its Z88 portable.

Included in the box are a carrying case, mains adaptor, four batteries, 128K RAM pack, manual and, of course, the Z88 itself. This, reasons Cambridge, means that buyers can take their portable home and start computing straight away. Cambridge acknowledges the incredible frustration felt by computer buyers if they have to keep returning to shops just to get the machine started. The Z88 pack costs £300.

System 3 thwacks 'look and feel' law

System 3 has delivered a blow to the "ludicrous" look and feel laws in America by overturning a two year old ban on its *International Karate.*

In the Supreme Court last week *International Karate* was allowed back onto the streets two years after it had been pulled. Back in January '87 Data East gained an injunction preventing US distribution of *International Karate*, alleging that the game ripped off its *Karate Champ.*

System 3 was forced to destroy all the games which were being sold in the US via Epyx. However, the Supreme Court judge over-ruled the earlier verdict, calling it "an error". System 3 cannot hope to gain enormous sales now for a game which is more than two years old, and is thus seeking damages from Data East.

"I want to make Data East suffer the way they've made me *(expletive deleted)* suffer," System 3's boss Mark Cale told *Express*. "I want the money from those sales back as well as compensation for the humiliation of being branded a pirate. It's already cost hundreds of thousands in legal fees.

"This has consequences for the whole industry. This look and feel business has got to a ridiculous level – of course two Karate games are going to be similar," he said. Look and feel is a legal term connected to US copyright laws which states that if one product is simply too similar to another then it can be called a copy.

Cale claimed that *International Karate +* had suffered too, "because no-one in the States would touch it in case it got injuncted". A furious Cale went on: "I'm going to do everything I can to smear Data East the way they did it to me."

When *International Karate* was first launched in the US by Epyx it became only the second British game to top the American charts. However, C64, PC and Apple versions had been on the market only a few weeks when the game was pulled. Data East was unavailable for comment.

Computers unhealthy? Lords not convinced

Calls for laws governing the use of VDUs and computers in the workplace have been thrown out by the House of Lords.

A select committee found scientific evidence that computers cause eye and muscular injuries was inconclusive. Calls for guidelines to be laid down were rejected.

Nevertheless, more than 70 members of the predominantly office workers union MSF (Mechanical, Scientific and Financial) are claiming compensation because they suffer from repetitive strain injury (RSI). According to the union, office workers are sustaining injuries to their wrists and elbows from constantly tapping keyboards.

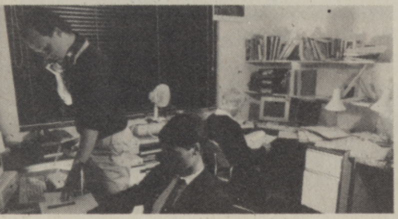
"Some may call it absurd but we certainly don't see it that way," said MSF's health officer Dawn Lake. "If you're making very rapid movements with your arms in basically one position it can be very painful.

"Doctors are telling our members to take a rest but they need to earn a living. Once you get this it becomes very hard to work at a VDU."

No details of the compensation claims are being released. Some are being made to the DHSS, whilst others are claiming directly from employers. Payments will depend on "proving an employer's lack of care". But the committee's report means claimants will struggle to gain substantial payments.

MSF says the condition can be avoided if people aren't forced to work on computers all day. "We need to break up the working day, which is quite feasible," said Lake.

No figures are available as to the extent of RSI, since statistics on the matter are not collected by the Health and Safety Executive.



• Computers at work: Little risk says Lords

Grandslam kops Liverpool

Silverware-toting soccer supremos Liverpool FC have been signed up by Grandslam for a computer game.

Kenny Dalglish's infuriatingly successful mob will appear on screen next year. However, neither the gameplay nor the name have been decided. "At the moment it's in its embryonic stages," said the firm's David Dudman. "But it looks like Liverpool are going to win the Championship so it'll be a great game for next year."

CD-ROM system for a cool £18K

A special CD-ROM disk is soon to be launched which holds details about a staggering 25,000 of Europe's biggest companies.

Market research, historical data and personnel details will be held on the disk, which is being developed by Clarinet Business Publishing. The firm will update information every month.

Unfortunately, the system – which includes a PC, CD-ROM player and the disk – weighs in at an incredible £18,000.

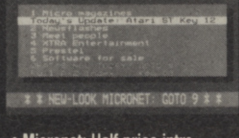
Micronet woos micro masses

The growing masses of new computer users are being lured on-line by Micronet with a New Year introductory offer.

From January 1st users will be able to join Micronet for £9.95 instead of the usual £20. This price will cover the first quarter but the offer is only scheduled to run until the April Fools Day.

"There are thousands of computer users who don't know what they're missing," commented Micronet's David Rosenbaum. "We expect to introduce many more people to Micronet."

Micronet offers computer news and reviews as well as a chat lines and multi user games. A free modem is also on offer to annual subscribers.



• Micronet: Half price intro

GAMES TOP TWENTY FULL PRICE

1	1	Operation Wolf	Spec, C64, CPC, ST, Amiga	OCEAN
2	3	AfterBurner	Spectrum, C64, CPC, ST	ACTIVISION
3	2	Double Dragon	Spectrum, C64, ST	MELBOURNE HOUSE
4	4	Last Ninja 2	Spectrum, C64, CPC	SYSTEM 3
5	8	Pacmania	Spec, C64, CPC, ST, Amiga	GRAND SLAM
6	10	Giants	Spec, C64, CPC	US GOLD
7	16	Return Of The Jedi	Spectrum, C64, CPC, ST	DOMARK
8	NE	Thunder Blade	Spectrum, CPC, ST	US GOLD
9	9	Football Manager 2	Spectrum, C64, ST, Amiga, PC, CPC	ADDICTIVE
10	11	Out Run	Spectrum, C64, CPC, ST, Amiga	SEGA/US GOLD
11	6	R-Type	Spectrum, ST	ELECTRIC DREAMS
12	NE	Microprose Soccer	C64	MICROPROSE
13	17	Speedball	ST, Amiga	MIRRORSOFT
14	15	Supreme Challenge	Spectrum, C64, CPC	BEAU JOLLY
15	13	Taito Coin-ops	Spectrum, C64, CPC	OCEAN
16	5	Daley Thompson's Olymp. Chall.	Spectrum, C64, CPC, ST, Amiga	OCEAN
17	20	Emlyn Hughes' Int. Soccer	C64	AUDIOGENIC
18	7	Game Set and Match 2	Spectrum, C64, CPC	OCEAN
19	NE	Rambo 3	Spectrum, C64, CPC	OCEAN
20	RE	Gunship	Spectrum, C64, CPC, ST, PC	MICROPROSE

GAMES TOP TEN BUDGET

1	2	Bomb Jack	Spectrum, C64, CPC, ST, Amiga, C16	ENCORE
2	3	Commando	Spectrum, C64, CPC, BBC, C16, Electron	ENCORE
3	1	Joe Blade 2	Spectrum, C64, CPC, ST, BBC, C16, Electron	PLAYERS
4	5	ACE 2	Spectrum, C64, CPC, C16	CASCADE
5	12	Advanced Pinball Simulator	Spectrum, CPC	CODE MASTERS
6	14	Air Wolf	Spectrum, C64, CPC, Atari 8-bit, BBC, C16	ENCORE
7	4	Footballer Of The Year	Spec, Elec, C64, CPC, BBC, Atari 8-bit, C16, MSX	KIXX
8	8	Biggles	Spectrum, C64, CPC	FIREBIRD
9	NE	Knightmare	Spectrum, C64, CPC, ST, MSX	MASTERTRONIC
10	21	International Rugby Simulator	Spectrum, C64	CODE MASTERS

COMPILED BY GALLUP

NE – new entry
RE – re-entry

RAPPED!

Storm of complaint over "sexist" Sagesoft ad

Business software publisher Sagesoft has been rapped over the knuckles for a nationwide ad promoting its network system.

The advertisement prompted 27 complaints to the Advertising Standards Authority (ASA) on the basis of sexism. It showed a woman standing over a computer terminal with the headline, "If she understands this headline, she'll understand our new network".

Sagesoft has promptly stated its regret at offending anyone. The firm explained that the idea was to show how simple the network is. Sagesoft went on to say that since many users of the network will be secretaries, and that most secretaries are women, it was logical to use this portrayal. It has nevertheless withdrawn the ad.

The 27 complainants, a high number by ASA standards, all interpreted the ad to be implying that women are stupid and unable to understand computers.

Meantime Commodore's Amiga ad has come under fire. It states that for £399 the machine is "streets ahead in graphics". One complainant pointed out that you needed to buy a modulator or monitor to experience the graphics and that should have been made clear. Commodore has retorted that the fact was explained in a footnote but was ticked off by the ASA nonetheless.

● What's wrong, girls?

Despite consisting of half of the population, women make up only 20 per cent of computer-skilled employees. This, argue many computer companies, is because women simply aren't applying for jobs in the technology industry. Only ten per cent of computer undergraduates are women. A similar percentage (or less) of the readership of most computer magazines is female.

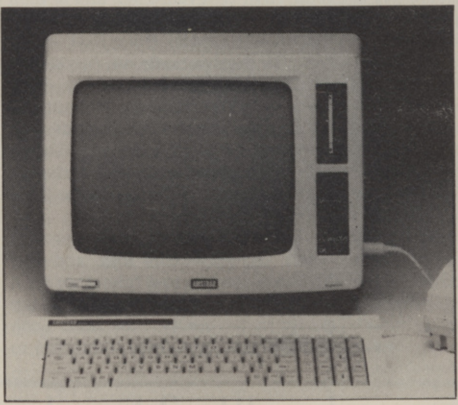
Disgruntled users get free adaptor for expansion port

AT LAST! AMSTRAD ENDS PCW GRIEF

Amstrad PCW owners unfortunate enough to have bought one of the recent batch of models sold with incompatible interfaces will be able to bring their machines into line for free.

Amstrad is giving away a "tiny gadget" which will make the PCWs compatible with peripherals such as mice and extra printers. The problem arose after Amstrad, faced with a UK shortage of PCW8512s, shipped in machines from Germany with reversed male and female connectors. This meant that they were incompatible with British standard peripherals.

Owners wishing to obtain the new adaptor may simply pick one up from their dealer. But Amstrad thinks the numbers who do so will be small. "The vast majority of PCW owners won't find a need for the interface since most use the machine simply for word processing," offered a spokesman.


• PCW: Compatibility problem solved

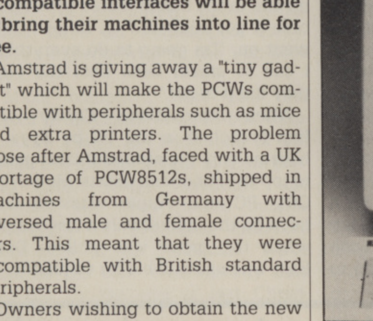
Originally Amstrad caused a storm of protest amongst the PCW fraternity by threatening to charge for the gadget. At the time Amstrad was reluctant to comment on the matter beyond saying that it was "nonsense". This change of heart is something of a rarity for a company which takes pleasure in being hard-headed.

Whilst it's obvious that something needed to be done, the Brentwood crowd are simply not used to giving things away, regardless of the circumstances. The spokesman kept up the firm's tough image by stressing that this pipe of peace to PCW owners isn't costing Amstrad much.

The company is apparently aware of which dealers received the German stocks and is strenuously denying that most of the PCWs bought here over the past few weeks are from that source.

1040 games up for grabs

The Atari 1040 ST is to be bundled with the same games currently appearing in the 520 Superpack.


• 1040ST: Games tilt

However, the initiative hasn't come from Atari itself. Only certain dealers (supplied by distributor SDL) as well as the Silica Shop will be taking the £499 bundle. Games sported in the package include *Buggy Boy*, *Marble Madness*, *Thundercats*, *Ikari Warriors* and *Wizball*.

"I think the 1040 is sadly underrated in the market place," mourned SDL's Paul Ellis. "The extra half meg goes a long way. I mean if you're desk top publishing on the 520 it can get pretty tight.

"This will be ideal for computer buyers who want a lot from their machine but also like to play games."

• Amiga: German debate

Amiga to visit Frankfurt

The first European Amiga Developers Conference has been organised by Commodore.

A broadly similar event was held in Washington last April and was promptly heralded a success. So CBM is inviting developers on its machine to go to Frankfurt on January 16th for a three day chinwag about the Amiga and to hear the "Gospel according to Commodore".

Comet clears Sinclair chaos

• Comet: Putting all the bits together

Complete versions of Amstrad's Sinclair PC200 machines are at last appearing in Comet stores throughout the country – but some shops are still waiting for salient packages.

Last week *Express* exposed a chronic supply "cock-up" with Comet stores missing monitors, operating systems, joysticks, games and manuals which should have been with the machine. Some angry buyers were taking machines home which could not be used.

Most of the stores contacted are now receiving the extra articles and customers are being informed. Those still waiting for the bundled items were confident of an imminent arrival.

In those cases buyers are still being asked to pay for the machines and then wait a few days for delivery of some items. Only one shop contacted – in Paisley – had no notion of when a delivery might be.

Another store summed up the current situation: "We've got everything in now except for manuals and they should be here within a few days."

Games mag comes unstuck after glue sniffing gaffe

BEST SELLING SPECTRUM MAG!
SINCLAIR User
£1.60
3 GAMES!
DAVID JONES' AMAZING
MAGIC KNIGHT
▼TRILOGY▼
WIN A REAL
AFTERBURNER
GASP!

• Sinclair User: Foot in mouth

Spectrum games mag *Sinclair User* found itself in trouble last week with TV show *Watchdog* and a Tory MP both ticking it off for making a jokey reference to glue sniffing.

The mag had run a competition for Airfix-style models. Contained in the copy was the offending line "just think of all the glue fumes you've got an excuse to inhale".

Although the gag caused something of an uproar, *SU* says it only received four complaints. "It just happened that one of the complainants wrote to everyone else," commented editor Graham Taylor. "In magazine terms, we put our foot in our mouth.

"*Watchdog* treated it as a 'look at those foolish people' story rather than branding us devils from hell," he said. "But we sincerely apologise and we're printing an apology in the next issue". But Conservative MP Kenneth Hind was infuriated by the comment calling it "a disgrace".

Asked whether he was surprised at the uproar Taylor told *Express*: "The furore is over now and we're putting it behind us. What with Roy Orbison dying and Gorby cutting his armaments the story has slipped into obscurity."

Standards debate breaks down

Hopes that computer users of tomorrow may have a single software standard were dashed last week as negotiations between high end industry groups broke down.

The Open Software Foundation backed by the likes of IBM and Hewlett Packard had been in talks with AT&T with the aim of bringing together a software standard which could be used by one and all in the future.

AT&T's UNIX operating system is at the core of the dispute. That firm, backed by a plethora of hardware manufacturers and software houses, appears to be going ahead with UNIX and any compromise looks unlikely.

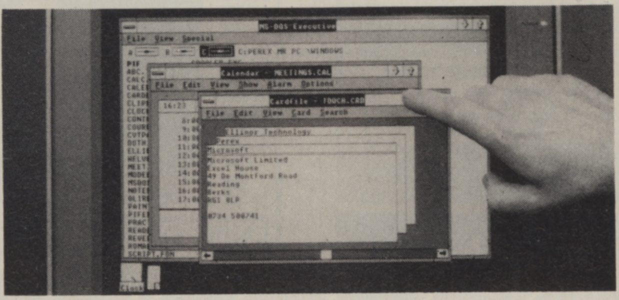
The Open Software Foundation pulled out of the talks because it felt they were going nowhere. It will continue to back IBMs AIX operating system which is not compatible with UNIX.

The gentle touch

Touch screen specialist Ellinor has come up with a £25 program which allows Microsoft Windows programs to be run without a mouse.

Users will need either a touch-sensitive monitor or Ellinor's £270 touch window which can be placed on the monitor in the same way as an anti-glare screen.

Microsoft Windows works under the mouse/icon driven WIMP system, and the window can be dragged across the screen or accessed with your finger. *TurboTouch* Windows comes in 5.25 and 3.5 inch formats.



• TurboTouch Windows: Finger picking

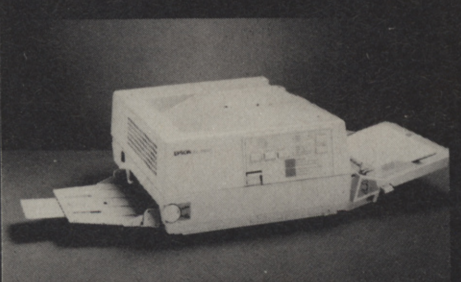
PCs backed in the USSR

There are fewer than 300,000 PCs in the Soviet Union – 200,000 of which are in schools. But a recent report predicts that in ten years time the Soviets will have more than 28 million machines.

Getting networked up?

A low cost network is to be launched by Infotron, costing about £99 per connection. The firm reckons that 90 per cent of networked transmissions in the office are less than 8k bytes and are labelling Commix "cost effective".

Test drive a laser printer



• GQ3500: Test drive option

Japanese printer giant Epson is wooing prospective laser printer buyers by inviting them along to "test drive an Epson".

The promotion is being held in 250 special Epson shops around the country. The firm has also lopped £200 off its GQ3500 laser printer with the price now at £1599.

More info on 0800 289622.

Are you ready for the Afterburner boogie?

Trendy London nightclub goers are bracing themselves for a new craze – dancing along to computer graphics.

West End night spot Paramount City has erected a 20 foot screen in front of its dancefloor featuring Sega versions of top games. Titles such as *Out Run, After Burner* and *Thunderblade* are accompanying furious dance tracks and holding the partygoers' attentions. The Thursday night computer specials have attracted other nightclubs to talk to organiser Dreamscape.

"Computer games are just right for the nightclub atmosphere," said organiser Leslie Bunder. "Trendy people are really picking up on computer games and dancing to graphics is like a very powerful experience.

"The visuals on a 20 foot screen are stunning," he added. "I hope that nightclubs will become a forum for first showings of brand new games. Clubs in London and elsewhere are really turned on by the idea."

Plans are also afoot to kit out nightclubs with scores of arcade machines so that "dancers can relax with a great game".

NEW COMPUTER EXPRESS

OUR OPINION

Selling out

Good news: computer shortages abound. Annually, plausibly, vociferously, the cry goes up from micro manufacturers that there will be hardware shortages at Christmas. For the most part, it's an attempt to jack up sales. But this time, it's different.

This time, it's the shops saying they're light of machines, due to the massive demand. Less obviously, its the near veteran C64 and Spectrums that are shifting fastest off the shelves, though STs and Amigas aren't exactly hanging about.

Whatever, the extraordinary take-up of computers this year has to be good news for every owner. With the influx of new buyers or upgraders, there's even greater reason for the software publishers and peripheral manufacturers to work harder at developing finer quality products.

One oddity of the rush is that all the talk of the "amazing" new machines – such as the Super ST and the ST console – evidently hasn't acted as a deterrent. The conventional view espoused by Commodore and Amstrad is that new products shouldn't be discussed for fear of affecting existing machines' sales. But Atari hypes away merrily.

Can it be that Joe Public is wise to the tactic and is voting with his chequebook for products that actually exist at the moment?

Better late

After years of requiring customers to buy computers and all their component parts separately, Sir Clive Sinclair has at last announced an all-in-one bundle pack for one of his machines.

It was back in 1984 that Amstrad latched on to the obvious virtues of a plug it in and away you go computer system. Treks back and forth to shops simply irritate. Few other consumer goods are sold on that basis, so why should computers be any different.

So a small cheer for Sir Clive joining the ranks of the bundlers. Better late than never.

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Much ADO about the ST

A double-edged music package is representing ADO's first foray into the world of computer software. The firm has previously involved itself largely in pop music circles.

Called *Dr Tiricc* (an anagram of critic) the ST program creates "inspirational" drum beats, music and even lyrics. Also, it offers "fun routines" such as impersonations of Michael Jackson. ADO admits the £12.95 program is basic but reckons it'll sell "at least 180,000 copies". Something of a tall order given that there are no more than 200,000 STs in the UK...

Beeb booster

Brand new publisher Beeb Software is to make its first foray into the market with a Basic Rom Emulator for the BBC.

In simple terms the £3.99 program will take an image of a Basic program and store it in the Beeb's ROM so that it can be accessed at any time with a star command of your choice.

"People have been baffled by using the Beeb's ROM for a long time and I think this changes things," enthused boss Peter Cumberland.

It's the TV age

If you saw one of the Mediagenic TV ads promoting the likes of R-Type *then you were one of 8.3 million people – or so boasts the company. And since the ads were screened on Saturday and Sunday mornings then you're likely to be under the age of 18 – just the sort of people Mediagenic wants to develop a yearning for its big Christmas titles.*

• Amiga: Peripheral opportunity

CBM'S BUSINESS PUNCH

In an effort to back its Christmas Amiga push, Commodore has drafted in a series of special software and peripheral bundles.

The offers are largely aimed at serious buyers of the machine, with the intention of giving customers a chance to pick up some add-ons for the machine when they buy it.

The special packs are:

- ●MPS 1230 printer with A1010 external disk drive and *Textcraft* – £430.
- ●MPS printer again with 501 expansion pack and *Superbase Personal* – £440.
- ●A1010 drive with 501 expansion pack and *Superbase Personal* – £260.
- ●A1010 drive, MPS printer, 501 expansion pack and *Superbase Personal* – £590.

No kidding! Ocean goes for the older generation

With an eye on the demographic charts Ocean Software is planning to launch a series of games aimed at the experienced but mature gamer.

The firm reasons that the players of yesteryear and today will soon become tired of *Rambo* games and will be looking for more cerebral offerings.

"You're appealing to people who are looking for a greater individuality in their lives," explained boss David Ward "They are looking for things that reflect their own personality rather than acting under peer pressure."

Ocean tried to break new ground last year with its life evolution game *Eco.* Although the idea was interesting, the title's lack of gameplay meant a poor reception.

"It wasn't finished properly," said Ward. "It was a brilliant idea which went 90 per cent down the road. If it had had that ten per cent more it would have been ten times better."

Ocean plans to launch a series of games which challenge players' intellectual manipulation rather than "mechanical or physical" skill. The firm will however be continuing with its usual line up as well.

• Ward: Eyeing ageing gamers

Genius comp

A trip to New York to see *Phantom of the Opera* is up for grabs for computer gamers buying any of Leisure Genius' classic titles. There's a form in each package for a chance of flying Virgin Atlantic to New York. Leisure Genius is part of the Virgin Group and specialises in computerised board games such as *Monopoly, Scruples, Cluedo* and the latest, *Risk.* The comp lasts until March.

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2. Commodore 64 + Olympic Special Pack

Retail price £149.99 – includes C64 computer, cassette deck, joystick and 10 great sporting software titles: *Decathlon, Matchpoint, Snooker, Barry McGuigan, SuperTest, Hypersports, World Series Baseball, Matchday, Basket Master, Track and Field.*

3. THREE *Star Wars* videos, courtesy of Domark

The movies are *Star Wars, The Empire Strikes Back* and *Return of the Jedi.*

4. Sega Super System console from Virgin/Mastertronic

Includes console, Light Gun and two games: *Hang On* and *Safari Hunt.* Retails at £99.95.Wow!

5. Atari XES games console

Normal retail price £99.95. The S of XES stands for Special.

PRIZES

s your true love gives to you...."

6. TWELVE copies of *Giants*, SIX of *History In the Making* from US Gold

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ROAD RUNNER
BRUCE LEE
GOONIES
WORLD GAMES
RAID
BEACH HEAD

Giants features *Gauntlet II, Rolling Thunder, California Games, 720 Degrees* and *Out Run*. A fabulous compilation: Spectrum and CPC £14.99cs, £19.99dk; C64 £14.99cs, £17.99dk.

History In The Making features *Beach Head, Bruce Lee, Spy Hunter, Raid, Goonies, Supercycle, World Games, Express Raider, Infiltrator, Beach Head II, Gauntlet, Road Runner, Impossible Mission, Kung Fu Master* and *Leaderboard*. The compilation is available on Spec, C64 and CPC, costing £24.99 cs, £29.99 dk.

7.SEVEN Navigator and SEVEN Megablasters joysticks from Konix

Konix Navigators retail at £14.99, with the Megablasters costing £6.99

8. TWELVE copies of *The In-Crowd* from Ocean

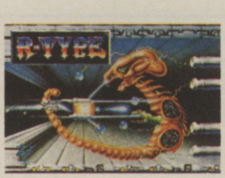
BARBARIAN
THE IN CROWD
ocean

A new compilation carrying titles which sold individually for over £75! The line-up: *Combat School, Target Renegade* and *Gryzor* (all Imagine); *Barbarian* (Palace); *Platoon* (Ocean); *Predator* and *Karnov* (both Activision/Mediagenic) and *Crazy Cars* (Titus). The latter is replaced by System 3's *Last Ninja* on the 64. *The In Crowd* retails at £14.95 on cassette and £17.95 on disk, across main 8-bit formats.

9. TWENTY FOUR copies of Infogrames' *Purple Saturn Day*

Recently touted in *Express* as quite possibly the best game of the year. Currently only available on ST at £24.95.

10. TWELVE copies of *R-Type* from Mediagenic



Available on 8-bit formats at £9.99 cs, £14.99 dk, on Atari ST at £19.99, Amiga £24.99.

11. Football signed by Liverpool's first team, from Grandslam

Novelty prize, off the back of Grandslam's new deal with Liverpool.

12. TWELVE copies of Melbourne House's *War In Middle Earth*

Just out for Spectrum, C64 and CPC £9.99cs; C64 £19.99dk; ST, Amiga, PC and Apple II GS £24.99.

THE 12 KEY QUESTIONS

Pick the right answer to each question and write the letter in the entry form

1. *Captain Blood*, the game with great graphics, was published by
a) Rainbird b) Software Projects c) Infogrames d) Enid Blyton

2. Atari's overall boss is
a) Alan Sugar b) Jack Tramiel c) Steve Jobs d) Col Gadaffi

3. The Commodore 64 gets its name from
a) The fact it that it has a 64-key keyboard b) The fact that is has 64K RAM memory c) The fact that it's the 64th computer Commodore developed

4. Amstrad is based in
a) Brighton b) Brentford c) Brentwood d) Benidorm

5. Mediagenic used to be called
a) Melbourne House b) Activision c) Argus d) Photogenic

6. *Donkey Kong*, *Top Gun* and *Platoon* were all published by
a) Ocean b) US Gold c) Gremlin d) The Beano

7. Amstrad has released a machine called the
a) CPC864 b) CPC664 c) Sugar-bun

8. Domark is called Domark because
a) The company used to produce bookmarks b) its founders' first names are Dominic and Mark c) anything's better than Bug-Byte

9. Atari is
a) an American company b) a Japanese coin op giant c) a program about African wildlife.

10. Sir Clive Sinclair is the
a) inventor of the Sinclair PC200 b) boss of Oxford Computers c) neither

11. Konix is
a) an Irish disk drive manufacturer b) a Welsh joystick manufacturer c) a make of American icecream.

12. Mastertronic began as
a) a budget-games-only firm b) MisterTronic c) CodeMasters

WHAT YOU HAVE TO DO

The competition is in two parts: the first one here, the second in next week's Bumper Christmas Special *Express*. Simply answer the questions correctly in each issue, fill in the two entry forms and send them with your answers to **Christmas Competition, New Computer Express, 4 Queen Street, Bath BA11EJ.**

The first 100 correct entries out of the bag after January 10th 1989 will win one of the prizes – taken in reverse order so that the 100th person wins the top prize.

Go for it. You've probably never had a better chance of winning a great prize.

RULES

1. All entries should contain correct answers to both sets of questions (*New Computer Express* December 10th and 17th), as well as the relevant tokens from each issue.
2. The competition is not open to any employees of Future Publishing or their relatives, likewise for any of the contributing companies.
3. The decision of the publisher of *New Computer Express* is final.
4. All entries must be received by 9.00am on January 11th.
5. As far as possible, the winners will receive prizes relevant to their formats.

COMING SOON: THE UPMARKET VERSION...

We felt that Christmas was the time for a few jollities, so don't worry if you're not much of a games player. *Express* will be running another major competition in the new year for those of more serious intent. So watch out!

ENTRY FORM PART 1

Simply fill in the letter of your choice in each box. Then save this form and send it off together with the second part of the entry form taken from next week's bumper issue.

1 ☐ 2 ☐ 3 ☐ 4 ☐
5 ☐ 6 ☐ 7 ☐ 8 ☐
9 ☐ 10 ☐ 11 ☐ 12 ☐

Name ____________________

Address ____________________

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☐ From 8000 Plus ☐ From ST Amiga Format
☐ From Popular Computing Weekly ☐ From The Guardian ☐ From Computer Shopper ☐ From Micronet ☐ Just saw it on the news-stand

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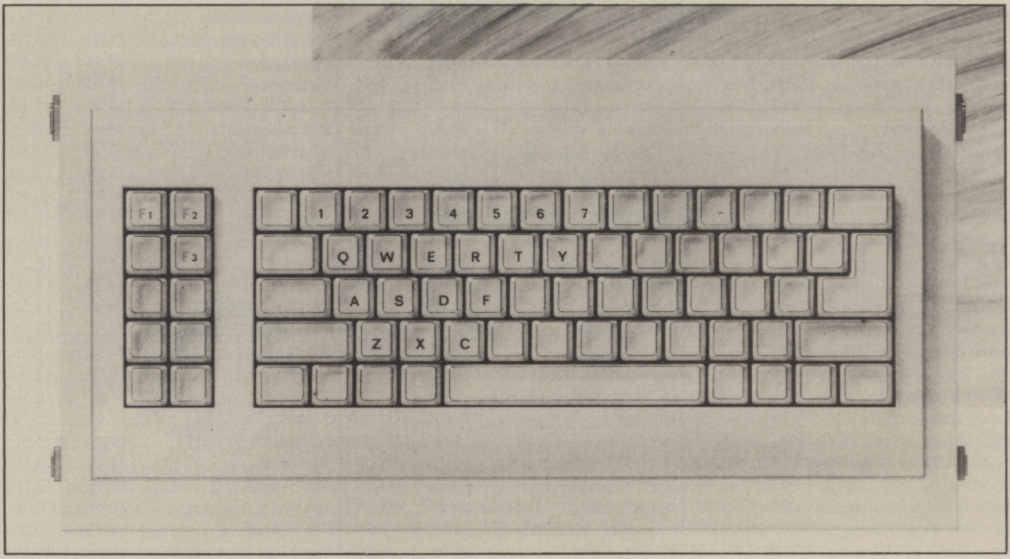
SINCLAIR BEATER!

After two years of development, Miles Gordon Technology has started building the prototype of the SAM Coupe, a machine that promises Spectrum compatibility and a whole lot more. Andy Storer was there for the unveiling.



• **Artist's impresssion of what the finished machine will look like**

For over two years the UK home computer scene has been dominated by just four companies: Amstrad, Commodore, Atari and Acorn. Since the days of the likes of Memotech and Enterprise (and the sale of Sinclair to Amstrad) almost no one has dared challenge this quartet.

Now all that could be changing. Miles Gordon Technology believe it has come up with a range of machines that could sell 250,000 by 1991. Due to ship in April, the first of the SAM range, the Coupe, has been revealed to *Express* in detail. Like the rival machine being developed by another small, ambitious company Flare Technology, the Coupe is basically an 8-bit computer. It nevertheless looks rather special.

The Coupe features a 71 key membrane-type keyboard steeped back at an angle of 11 degrees to provide more comfortable input. The entry level machine will permit software to be loaded from an ordinary cassette recorder but one or two Citizen-made, ultra slim 3.5" disk drives can be slotted in under the front. They're expected to cost around £70 each. The disk operating system allows for a formatted capacity of 720k per drive and users of the Plus D and Disciple will find their current MGT equipment Coupe-compatible.

Wide appeal

The machine has output facilities for TV, composite video and RGB and a low-cost colour monitor is also planned for launch in April. The provision of joystick, mouse and lightpen ports ensures the machine should appeal to a wide range of users and the addition of double buffered 32Mhz MIDI in and out would seem to underline this.

Clearly the aim is no less than to capture gamesters, school children, small businesses and home musicians in one swoop all at an extremely low price.

Network option

Particular attention has been paid to making the machine as attractive to schools as possible. The MIDI port doubles as a network socket allowing for connection to 16 other Coupes. There are also plans to release software which will make the machine compatible with the Acorn Econet system currently prevalent in schools. Indeed, networking is seen as an essential feature of the design – MGT wants to see more games developed which encourage gameplay between users, using the SAM as a tool rather than an opponent.

But by far the most interesting feature of the Coupe is a memory management which allows for four discrete programs to be up and running simultaneously and available at the press of a function key. Couple this with the four independent screen modes and you could be running a shoot-em-up whilst playing an adventure, writing a letter and planning your budget. Multitasking on an 8 bit! Add the spell checking Word Processors, Desk Top Publishing, Database, Comms and programming packages planned for simultaneous launch in April, and the SAM Coupe is exciting stuff.

Two things remain to be seen. Can MGT take the project to completion by next summer? And can it come up with a way of marketing and distributing it effectively?

If so, it could cash in on the current disgruntlement many Sinclair owners feel toward Amstrad and have a real success on its hands.●

The design brief

MGT believes computers should allow you to "put your foot on the gas and go". Here are its plans for the Coupe:

- a computer for schools, first-time users and serious hobbyists costing less than £150
- low ongoing costs for owners –software at pocket-money prices
- high resolution, pixel by pixel colour definition and an 80 column screen
- Midi capability and a sound chip capable of more than beeps
- low-cost upgrading for memory and peripherals
- full networking facility
- an external design which will appeal to parents and children, male and female, serious users and beginners

Spectrum compatibility and beyond

The machine runs in four basic graphics modes, one of which is claimed to be Spectrum-compatible. At all times the user can choose from a palette of 64 colours with modes and palette selection determined by a software switch.

MODE 1

A 32 column, 24 row screen capable of displaying four colours and claimed to be 'almost 100 per cent ' compatible with existing Spectrum software.

MODE 2

Again, a 256 x 192 screen but with pixels organised in 8 x 1 blocks and thus offering eight times the resolution of Mode 1. This has been included to encourage third-party development of improved Z80 software.

MODE 3

A 256 x 192 pixel screen allowing 16 true colours to be displayed at any one time. Ideal for art and graphics packages, this mode also allows a split-screen option enabling lower res modes to be displayed - a perfect mode for adventure games ?

MODE 4

A 4 colour, 80 column display offering 512 x 192 resolution designed for word processing and serious applications incorporating windowing and page manipulation.

Tech-spec

At the heart of the Coupe is a custom ULA with 3,000 gates – meaning there are only eight chips on the main circuit board. It uses a Z80B processor running at 6Mhz, so machine code programs should run at almost double the speed of the Spectrum. The machine also comes with 256k of RAM expandable up to 512k. The specially written Basic, which draws upon and extends Beta Basic, can address all available memory. The ten function keys will give the user the option to perform certain operations at any time, through pop-up menus, while a program is in memory. There's also a 6-channel stereo sound chip to complement the impressive range of screen modes.

The track record

MGT was formed in 1986 and is best known for the Disciple and Plus D disk drive and printer controllers for Spectrum machines. Designed by Bruce Gordon and marketed by Alan Miles, these highly-acclaimed products were sold by mail order along with a range of printers, scanners and disk-drives. Their joint success has allowed them to raise sufficient funds to realise their initial ambition in setting up the company – the development of a high-value entry-level British-made computer filling the gap left by the demise of Sinclair Research.

clik-ST

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Dear Reader

Another week, another bulging letters bag. Why don't YOU make a contribution to the Britain's liveliest, most up-to-the-minute computer forum? Write to:

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Yours in anticipation,

The Express Editorial Gang

PRICING GAMES: THE INSIDE STORY

It's simple, you charge what the market will bear: £9.95 if it's full price. The UK distributor (and retailer) get 55 per cent of that, leaving £3.89 after the Vatman gets his whack. Then there's 27p for the cassette, 13p for the plastic box, 15p for the instructions, inlay and side label, which leaves £3.34. Pay the programmer 15 per cent or roughly 58p, and you've still got £2.76.

Now a hit product may sell 10,000 pieces. That's not a Christmas number one, but a top five during most of the year for – say – a Spectrum title. Now you hire a merchandising team (a must for the majority of software houses), price £3,000, for a months' retail push. You print the posters for the windows and walls: £1,000. Take three well placed ads in the monthlies: *C&VG* (£1,500), *Crash* (£900) and a last minute bargain in "any mag with a budget to meet" (£600): grand total £3,000.

As a software house, you're laughing – you've just made £20,000. Don't forget the wages though, and the company cars or the PCW show stand that'll cost £50K next autumn or the head office building rent etc.

Now release an average product, be lucky and sell 4,000 pieces. That's £13,360 nett before royalties. Forgot to mention the £3,000 advance to the programmers, but everyone needs to eat. So that leaves £10,360 nett. Take out four ads and use those great merchandisers and you've got £2,300 left to pay for the Porsche and the typewriter ribbons.

No wonder software houses stuff out loads of half written games for 85p a piece (software house's price to distributor for budget games). Pump your money in and pray for volume!

With budget games, allow for cassette runs at 20p a go, and print and packaging coming in at 10p. Then take off a royalty of 10p and you've got 45p a unit gross profit to run the company off. Now you know why you don't see much budget advertising!

So you may ask yourself, where are the fortunes being made in games software? As far as publishing goes, the answer, in short, is nowhere. While the industry is big enough to make a very small number of people a little well off, the only real money in the business is that injected by multinationals covering their corporate bases, just in case computer gaming takes off and becomes the mass entertainment of the future.

Mystery WINNER prize

Now all you budding Victor Kiams out there dying to get into games software can boot up their "serious money" *Lotus 1-2-3s* and work out a few numbers. It is not a nice prospect after all, is it? Now you know why so many software houses go bust, particularly the ones that advertise. If you don't believe me, read on old magazine's advertisers' list.

A senior software industry figure, Where-eversville

✗ ***This is all a bit bleak, isn't it? The Oceans and US Golds of this world continue to turn out a fair old number of titles and since they aren't doing it wholly for the love of computing, there must be some money to be made. What about overseas sales and compilations? What about the occasional monster hit that sells above 50,000? What about making a smarter choice of magazines to advertise in?***

Since you're obviously so penitent, we're awarding you a Mystery Prize: a small but perfectly formed begging bowl. Shame we don't have an address to send it to.

HAVE I BEEN SUGARED?

Being an albeit first time computer purchaser I have recently (and am beginning to think mistakenly) purchased the latest black keyboard version of the Spectrum +2. This is designated the +2A, which boasts – according to the manual – to have been "designed to incorporate the more advanced features of the +3" (ie RAMdisk and disk operating system, parallel interface, additional auxillary interface, etc etc). But Amstrad have neglected to change the "pin-outs", apparently.

Could you explain precisely what this means? Having not owned the computer for very long and not being by any means an experienced user, I am unwilling to take advantage of the expansion facilities if the purchase of peripherals proves to be an expensive mistake.

With the software I have attempted to use to date, there have already been problems, notably:

i) ***Starglider***: The 48K version simply stops loading at stage 7D in the loading procedure, and the computer refuses to accept any more data. The 128K version loads part of the graphics only and the sound effects.

ii) ***The Shadows of Mordor***: The computer will accept text only and any attempt to load the graphics on side B of the tape results in a black (blank) screen!

iii) ***The Bard's Tale***: It has proven impossible to enter the Wine Cellar when the prompt to load is asked for.

Is this evidence that much of the 48/128K software is incompatible with the +2A? The only program so far that has loaded and run faultlessly is the excellent *Tasword Plus Two* WP package. Yet having been warned of possible interface problems I am unwilling to invest in a printer to take full advantage of this facility.

Other references that have been made to the +2A have been less than laudatory and I am beginning to have misgivings. Are there any real advantages to owning a +2A as opposed to the +2 or have I been "Sugared"?

Roger March, East Dulwich, London

✓ ***What appears to have happened is that Amstrad upgraded the circuit board in the machine, without making corresponding changes to the wiring of the pins on the expansion socket. This means that as things stand very few – if any – existing peripherals will work fully with the +2A.***

Since the strange machine first quietly appeared about four months ago Amstrad has been exceptionally tight-lipped about any problems. The most it has ever said is that some of the older Spectrum software may not run on the new machine.

That is quite simply not good enough. Users need to know clearly and exactly which peripherals and software will run on the +2A, now that it has superseded the old +2.

The only general advice we can offer at this stage is that you should always ask computer retailers to check whether the product you want to buy will work with the +2A. Indeed, you should only ever buy on the understanding that you can return goods if they don't work.

We will be returning to this whole topic for a more detailed look over the next few weeks. In the meantime, we'd be interested in hearing from any other +2A purchaser with software or peripherals difficulties. Write to Sugared, c/o New Computer Express, 4 Queen Street, Bath BA1 IEJ.

PS to Roger March: You would've won a mystery prize of Spectrum software – only we weren't sure that the package in question would've run on your machine...

SHORT CIRCUITED

In *Express* Issue 4 you answered a query from Roger Colbeck on Amstrad 1640 display upgrading in the "Tech Tips" area on page 36.

However, you seem to have got a little confused with your answer! At one point you say that "that probably means cutting tracks on the circuit board"!!

Pages 435/6 of the 1640 Manual explain how you can use the "display selector switches" to obtain EGA output or disable the Internal Graphics Adaptor to use an alternative graphics card.

Andy Johnson, Micronet

✓ ***We do our level best to give these Micronetters a function in life. Every once in a while, we'll bung in an oddity just to keep them on their toes. Actually, it was a wee mistakette...***

WHERE WERE YOU?

Where were you a week ago? If I had read your review of *AfterBurner* on the ST then I wouldn't have bought the damn thing!

I agree with Andy Storer, but would voice my opinion much, much more strongly. The graphics are lousy (see *Carrier Command* for 'good'); the gameplay is almost random in that 'locked on' targets are not killed except on a percentage basis; and chasing enemy planes in order to work a Sidewinder up his chuff is impossible. Oh, and the high score table isn't saveable – the manual says it is. I have been ripped off, and will not buy another Activision game again – they're garbage.

Second point, RS232 (Technobabble) is an area of a load of confusion and *********. However, there are rules and certainly a lot of them are obeyed by equipment vendors.

To my knowledge (admittedly in industry as opposed to the home computer market), most of the physical interfaces (plug or otherwise) are supplied in 25 way (pins or sockets) 'D' type (standing for Delta, 'cos the connector is delta shaped). These are numbered 1 to 25, giving the pins 2 and 3 an allocation of Transmit Data and Receive data. Pin 7 is ground, so a lot of equipment can work using just these three pins.

It's only when one realises that data transfer between two devices – printers, computers or whatever – cannot be treated like a couple of tons of nutty slack being dropped down a coal-hole, and that a certain amount of 'foreplay' (can I say that?) must happen in order to transfer that data securely, that the other signals allocated to the 'D' type connector come into consideration. This may be a useful future series, which I would be happy to help you with.

Finally, can I add my agreement to the comments made by Bill Brooks about the stupid and slavish devotion shown by schools to the Beeb? It was a great thing in its day, but we in the real world don't use BBC Basic for anything.

Ken Halliday, Gandalf Digital Communications, Warrington

MEANWHILE, IN JAPAN

Anyone interested in games and/or comics please come in contact with me. I own an IBM CGA and MSX 2 and don't want to die on this isolated island.

Tsuyoshi Yamashiki 4 -3-16-216
Nakarokugo, Ohtaku, 144 Japan

✓ ***How could any of our readers fail to be moved by such a plea? Stand by for an avalanche of MSX letters, Tsuy.***

NEW WAY FOR OLD GAMES

There are not many games for the older person, such as pensioners. I have not been able to get the games I would like for my Spectrum +3 on disk. It would be nice to relax with *Yahtsee*, *Scrabble*, *Fifteens* and *Crib* on the computer as all the scores are worked out.

The games must be about somewhere as they were written here in ENGLAND, but played in another country on COMMODORE. (Your magazine is first class, by the way!)

C Matthews, Itchen, Southampton

✓ ***Software publishers don't always realise that games computer owners aren't all zapping youngsters. That said Scrabble Deluxe is available on the +3 at £15.95. If***

☞

● WOE, WOE AND YET MORE WOE

Mystery WINNER prize

Since I purchased my Atari DTP system (comprising of a Mega ST2 laser printer, mono monitor, and *Timeworks DTP*) I have been hounded with problems.

I have been involved with home and business computers for over five years now and I occasionally read in the computer press of peoples' troubles, usually extensive, and I couldn't help but think that mostly these were exaggerated grumbles from people who expect something for nothing.

I now think differently.

Firstly, when I set up the system I found the mouse supplied was defective. So I went back to Evesham, the company from whom I bought the equipment, and exchanged the computer, to discover that the new Mega had a faulty disk drive. Fortunately the maintenance contract covered that.

Then I found one of the *Timeworks* disks was corrupt so I couldn't run my DTP software. This I exchanged at Electric Distribution during the PC Show this year.

Then came the major headache. Some work came in for me to do, just a simple letterhead with a small logo. I compiled the work, logo drawn with *Easydraw 2*, text laid out using *Timeworks DTP*, just one font, only 22 words total, and started to print them on the laser. One hundred copies were required.

The first page printed marvellously. Then the second popped out, graphics only on this, no text. So I started again, but still the same. In the end I tried cutting out the graphic, removing all accessories, and several other things, all to no avail.

So I called Softline (Electric Distribution's 'helpline'). First of all they couldn't help at all, they just suggested I send the problem in writing to them and they would see what they could do.

I did. No reply.

Then I phoned again. This time I was informed that some packages had been sent out with faulty printer drivers and if I returned my copy to them they would replace it with a corrected one.

This I did. I sent the disks first class recorded delivery. They received them the next day – I know because I called to check. One week later I received the 'new' corrected disks. Although they were actually new disks, the files were the same as the old ones. I checked them with the backup copies of the originals I still had.

Needless to say the problem was not solved. I called Softline again. This time they said they would speak to the programmers and get back to me later that day. They didn't – call me back, that is. I called them again to be told they knew all about the problem: it was caused by the lack of memory in my Mega ST2. Why not try it on a 1040 ST, they suggested!

This did it for me. I was/am trying to start a business; I had had enough. I took *Timeworks* back to Evesham and they kindly exhanged it for *Fleet Street Publisher* from Mirrorsoft.

A few days later I received by mail, from Evesham, the SLM804 driver from *FSP* and I am now producing documents containing at least four fonts (in several sizes), clip art, and a scanned photo printing the latter at 150dpi. This all makes for a very full, reasonably complex page. And guess what? No trouble, I printed 100 perfect copies last night.

I have had two reasons to call Mirrorsoft's helpline recently. Both problems were solved instantly by very helpful staff who deserve all my thanks, and because of whom my business now has a fighting chance.

Greg Shackleford, Ruislip

✓ OK, we've had enough. Your tale of woe – even in this abbreviated version – is so evidently appalling that we're going to break with convention and offer a second Mystery Prize. Since you've had such a tough time starting a business on an ST, what you evidently need is some relaxation via a top ST game. R-Type is being despatched instantly.

NB All other readers: No other tale of woe will gain a prize. Well, not unless it's even more horrendous, or a good deal shorter.

BARGAIN OF 1988!

As you launched what must be the brightest new computer magazine – which I bought because I saw the magic letters QL on the front cover – you must be wondering whether, even in spite of your late start, you can list the bargain of the year for the Sinclair QL or any other computer user. You must be looking for the real cost saver, just as I am seeking to be the winner of your mystery prize.

Look no further.

I have done the necessary research and come up with the answer.

In the December issue of the magazine dedicated to the QL, Mike Johnston, organiser of the Christmas ZX Microfair held at the New Horticultural Hall, Westminster, on December 10, offered reduced priced advanced tickets for adults at £2.00. Admission on the door was £2.50.

Being a pensioner, I was about to take advantage of this generous offer as every little helps.

Then I reflected that if I were to add up the cost of two first class stamps at 19p and two envelopes of decent quality – a self-addressed envelope was requested – there could be a saving of all of 10p. I decided to write to *New Computer Express* instead.

There it is (or was): the computer enthusiasts' bargain of 1988 – an advance ticket for only £2.00 for the ZX Microfair, resulting in a saving of 10p. This one will be hard to beat in the New Year.

Scrooge is alive and well and living in London's Park Lane.

Stanley Hurwitz, Cirencester, Gloucester

✗ What a complaint! Here is the saintly Mike Johnston offering you the remarkable sum of 10p, and all you can do is cavil at his meanness! So what on earth are you going to say about our Special Mystery Prize of 20p? Write and tell us – you'll still have a whole penny left over...

☞ you're having any difficulties tracking it down, try phoning Leisure Genius on 01 727 8070. It also has sundry other vaguely similar cards/board game titles, such as Scruples (£14.95) and Risk (due in January at the same price). You could also try CDS on 0302 21134. But no one, as far as we know, has published Yahtsee, Fifteens or Crib in computer form in the UK.

FIGURING IT OUT

Whilst the review of the new Sega 16-bit games machine is very interesting, is there any point in such a graphic standard if it is only to be displayed on a poor-quality, low resolution TV set?

Can you therefore give us the latest on the proposed High Definition TV standard, and also tell us whether any of the machines mentioned in the article can be connected up to colour monitors, assuming that we can beg, borrow, steal, or as a last resort, even save up to buy one?

John Smart, Hitchin, Herts

✓ The Sega has a standard RGB output, so it can be connected with any monitor. But there is nothing in the Sega that suggests it will work with the High Definition TVs.

BUYERS' BIAS

I found your PC Buyers' Guide interesting and would like to see a follow-up with emphasis on the cheaper models, featuring:-

1) Information not just on the "best buy(s)" but also on the main contenders (Amstrad PC1512 and PC1640, Opus PC, etc). Note how *Which?* manages to compress a large amount of information into its comparison tables.

2) In each case include prices for the commonly recommended combination of double disc drive and mono monitor.

3) Comparison with non-PCs with PC emulators (eg Atari ST plus PC ditto)

Frank Bott, Solihull, West Midlands

SHOME MISHTAKES

What on earth happened to the PC buyers' guide on pages 18 and 19 of Issue 4? The Advent got 23 out of 20! The Amstrad PC2286 has got great storage !!! Why on earth does the PC2086 only get 5 for its colour VGA but the PC2286 gets 13 for its mono? Also, why no mention of included software on Amstrads – Microsoft Windows, GW Basic etc? I know this sounds biased (it is!) but I think all the computers deserve a fair hearing.

As with many people, I too do not want 50 pages of games, continuous pages of "my computer's better than yours, etc"

I S Arnell, Portsmouth, Hants

PS If you think the MSX is bad, try the MK14 (the original Sinclair)!!

PPS Any tips on spelling or handwriting?

PPPS Whatever happended to *Jet Set Willy*? it was all the rage back in '84.

(That's enough PSs – Ed.)

✓ The storage ratings were supposed to have been out of 25, and the PC2086 display rating was supposed to have been 15 – the overall total for that machine of 63 was correct. These and a couple other errors on those pages mentioned last week, were due to a distressing production foul up for which we've already executed someone. We shall be reprinting a corrected and updated version in the near future. Meanwhile, our apologies.

JUST NOT PLAYING FAIR

I have to agree with your comment in *New Computer Express* Issue 4 concerning Martech and *Commodore User*. To review a demo or preview of a game is like buying an unfinished book: you only get half the story. Surely the whole point of a review is to tell the reader the quality of the product, but how can this be done without the finished item? You simply cannot get a full impression of a game from a preview.

Exclusive 'reviews' in computer magazines are commonplace. I remember (many years ago) *Crash* printing an article in which a rival magazine had 'exclusive exclusives' of imaginary games. This was meant as a light-hearted look at a competitor, but the offending article had to be removed from thousands of copies of *Crash* before it went on newsagent's shelves, thanks to a threatened lawsuit. Obviously someone failed to see the funny side.

More recently, *The One* reviewed *Federation of Free Traders*, giving the release date as "September". Gremlin say they hope to release it on December 10th. Even if the magazine reviewed an almost-finished version, what's the point if the public can't get their hands on it for another two months? Frustration factor 10, I think.

Express has an advantage over monthlies in software reviews, and I'm glad to see that you use it to full effect without over-exploitation (ie reviews don't dominate the whole magazine).

I'm sure 'exclusive exclusives' are not the fault of magazines alone. If people like Martech want a preview in a magazine, send a couple of photos and a cassette insert! If the game's any good, that's all that is needed.

The rule to stick to is this: magazines review games just before they are released and only when finished. Software houses, be careful what you send to inscrutable magazines.

After all, the public lose out in the end.

Russell Jackson, Newthorpe, Nottingham

✓ It's not in anyone's interests for magazines to wait until a program is actually in the shops before starting to review it – if they did it would (in the case of the monthlies) be 3-7 weeks before any reviews were published. So there are strong reasons for a magazine trying to obtain games for review before their release, PROVIDED the software itself is complete. (There is often a gap of several weeks between the code being finished and the game going on sale – this is for final bug-testing, package printing, duplication and distribution.)

The danger is that in the race for exclusives magazines will attempt to review games before the programming is finished. They may then either pan them unfairly (as Martech claims) or in other cases give them an unjustified favourable review, taking on trust the software house's promises that the sound-track will be brilliant and the gameplay substantially improved.

Our policy is to review only finished software – otherwise it's a "preview". As a weekly, we will still normally be able to get our reviews published at about the same time as the software goes on sale.

Incidentally, the lawsuit referred to above was placed by EMAP – the firm behind Commodore User...

COME AGAIN?

Come on Express. Remember we are Gainstar and not Gamestar. *Roger Rabbit*, *Dungeon Masters* and *Sword of Jordan* are our speciality, so get our name right or else.

Mike Fatoohi, Gainstar

The Disk Organiser

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The Disk Organiser creates a complete library of all your floppies and/or directories allowing you to hold details of all your files no matter where or how they are stored. You may keep details of shared files, files available on networks, or files held by personnel at remote locations. Personnel may request specific files knowing that the data within is what they require, to be sent by facsimile transmission or modem. Very efficient, very impressive.

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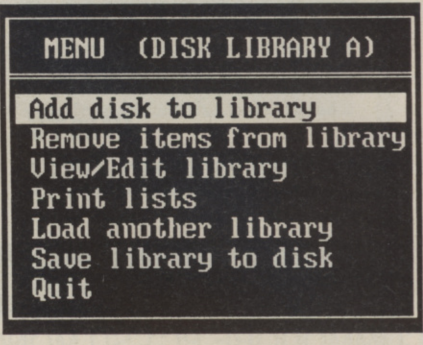
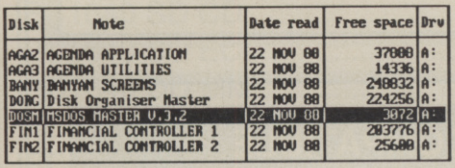
You may print out or display on screen reports of various formats which allow you to maintain records in the manner you prefer. You may print out your selected reports on standard continuous or sheet paper, or you may find it more appropriate to print your reports on the personal organiser size, laser quality continuous stationery supplied with this software. You get a personal organiser binder too. Very flexible, very neat.



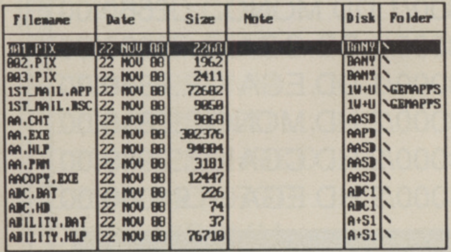
```
MENU  (DISK LIBRARY A)

Add disk to library
Remove items from library
View/Edit library
Print lists
Load another library
Save library to disk
Quit
```

▲ Main menu



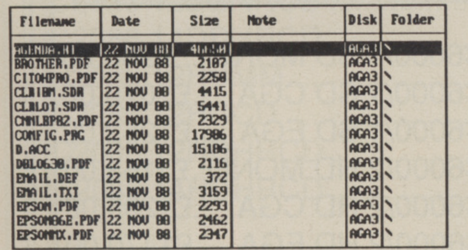
Disk	Note	Date read	Free space	Drv
AGA2	AGENDA APPLICATION	22 NOV 88	37000	A:
AGA3	AGENDA UTILITIES	22 NOV 88	14336	A:
BANY	BANYAN SCREENS	22 NOV 88	248832	A:
DORG	Disk Organiser Master	22 NOV 88	224256	A:
DOSM	MSDOS MASTER V.3.2	22 NOV 88	3072	A:
FIN1	FINANCIAL CONTROLLER 1	22 NOV 88	283776	A:
FIN2	FINANCIAL CONTROLLER 2	22 NOV 88	25600	A:

▲ All disks in your library



Filename	Date	Size	Note	Disk	Folder
001.PIX	22 NOV 88	2260		BANY	\
002.PIX	22 NOV 88	1962		BANY	\
003.PIX	22 NOV 88	2411		BANY	\
1ST_MAIL.APP	22 NOV 88	72682		1W+U	\GEMAPPS
1ST_MAIL.RSC	22 NOV 88	9850		1W+U	\GEMAPPS
AA.CHT	22 NOV 88	9868		AASD	\
AA.EXE	22 NOV 88	302376		AAPD	\
AA.HLP	22 NOV 88	94004		AASD	\
AA.PRM	22 NOV 88	3181		AASD	\
AACOPY.EXE	22 NOV 88	12447		AASD	\
ABC.BAT	22 NOV 88	226		ABC1	\
ABC.HD	22 NOV 88	74		ABC1	\
ABILITY.BAT	22 NOV 88	37		A+S1	\
ABILITY.HLP	22 NOV 88	76710		A+S1	\

▲ All files in your library



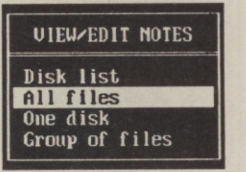
Filename	Date	Size	Note	Disk	Folder
AGENDA.HI	22 NOV 88	[illegible]		AGA3	\
BROTHER.PDF	22 NOV 88	2187		AGA3	\
CITOHPRO.PDF	22 NOV 88	2250		AGA3	\
CLRIBM.SDR	22 NOV 88	4415		AGA3	\
CLRLOT.SDR	22 NOV 88	5441		AGA3	\
CMNLBP82.PDF	22 NOV 88	2329		AGA3	\
CONFIG.PRG	22 NOV 88	17986		AGA3	\
D.ACC	22 NOV 88	15186		AGA3	\
DBL0630.PDF	22 NOV 88	2116		AGA3	\
EMAIL.DEF	22 NOV 88	372		AGA3	\
EMAIL.TXT	22 NOV 88	3159		AGA3	\
EPSON.PDF	22 NOV 88	2293		AGA3	\
EPSON86E.PDF	22 NOV 88	2462		AGA3	\
EPSONMX.PDF	22 NOV 88	2347		AGA3	\

▲ All files on one disk

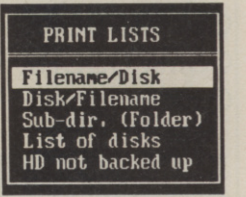
- ★ Prints reports on standard continuous stationery
- ★ Prints reports on enclosed personal organiser stationery
- ★ Prints reports of all files referring to disk/directory on which they're stored
- ★ Prints reports by disk detailing file/folder contents
- ★ Prints reports by folder/directory detailing file contents
- ★ Prints reports listing all disks/directories held in the library
- ★ Prints reports by file type/size
- ★ Prints reports by date created/last amended
- ★ Prints reports detailing all files NOT backed-up

- ★ Shows hidden files and notates them
- ★ Shows all files that are back-up files
- ★ Shows you file contents (you describe file contents using notes)
- ★ Stores your print-outs in a personal organiser binder
- ★ Shows you free space on all floppies stored in the library

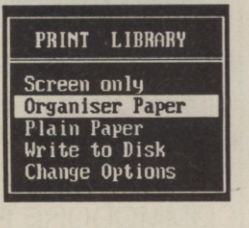
- ★ Lets you update your disk data without losing any previously recorded notes
- ★ Lets you record which files were sent to which people
- ★ Lets you request specific data from a remote location
- ★ Lets you optimize the use of your disks
- ★ Lets you add/delete disks/directories to/from the library
- ★ Lets you save your data automatically or by keystroke command
- ★ Lets you find data by disk ID, filename, filetype, size, date or note



```
VIEW/EDIT NOTES

Disk list
All files
One disk
Group of files
```



```
PRINT LISTS

Filename/Disk
Disk/Filename
Sub-dir. (Folder)
List of disks
HD not backed up
```



```
PRINT  LIBRARY

Screen only
Organiser Paper
Plain Paper
Write to Disk
Change Options
```

Now you can view all the data about all your files no matter where they're stored and then access your data in a flash. No more loading the wrong disk. No more loading the wrong file. No more searching around for somewhere to store your data. No more excuses for not knowing which of your files are backed-up.

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PART 1. THE ENTERTAINMENT BUSINESS

In the first of an occasional series, Peter Worlock explains the options open to someone wanting to make a career out of games computing.

There are few hobbies that offer you the chance of making a living. The amateur astronomer, or photographer, or golfer can dream about turning professional but there's little hope of those dreams becoming a reality.

Personal computers are different, especially in computer entertainment. There's an enormous demand for entertainment software, and for the people capable of producing it. But, it's worth stressing immediately, breaking into the business is not as easy as it was just a few short years ago.

In the early years of the personal computer boom, all you had to do was write a program. After that you could sell it yourself mail order, or distribute it to the various interested retailers, or have it marketed by one of the burgeoning number of software publishers.

By and large, that's no longer true. In those early days, software production was very similar to book publishing: a lone author worked from home and then sent the completed product to a publisher who handled production, distribution and marketing. Today, the software business is much closer to film production: it's a team effort involving managers, designers, graphic artists, musicians and – almost last – programmers.

Although there are one or two supremely talented individuals still capable of producing original software, complete with dazzling graphics, sound effects and music, all driven by fast, compact code, they are very much a minority.

Most programmers in the software business are salaried staffers, and that usually means working to somebody else's designs and timescales. That doesn't mean it's just production-line coding, but you've got to do your porridge first. Jez San, of Argonaut Software – famed for *Starglider II* – said, "Newcomers have to cut their teeth on something, so it's possible that they'll do joystick-reading routines to start with. But they won't be doing that for the rest of their lives.

"Within a couple of months they'll be working on a big project with a lot of responsibility."

But with so many people working together, how do the different areas overlap, and what does everyone do?

The Coder

Once, the actual programming of a game was everything. Now it's only a part of the process – a crucial part, admittedly, but still only a part.

The change in emphasis is reflected in the increasing use of the title "coder", as opposed to "programmer". You take somebody else's design specification, somebody else's music, somebody else's graphics, and you translate these parts into machine code.

The importance of machine code cannot be overemphasised. It's no good being a first-class Pascal programmer, or a wizard in C. Virtually all arcade games – and that's more than 90 per cent of all games – must be written in machine code for speed of execution and for compact size.

It's also useful, although not essential, to have experience of more than one machine. Since a lot of the programmer's work is converting games from one machine to another, it obviously helps if you understand the source and the target hardware. And although there is still a shortage of good 16-bit programmers, demand remains high for machine coders on Z80 and 6502 computers.

One of the encouraging aspects of breaking into the programming business is that, unlike most job opportunities, you don't get caught in the experience trap, where you can't get the job without experience and you can't get experience without the first job. All would-be employers will want to see examples of your work, but you don't have to show them a published game.

Most important of all, you have to be a team-player. "We've had a few excellent programmers who were loners," Jez San says. "But we couldn't use them – we need people who can work as part of a team."

The Artist

As the paying public has become more demand-

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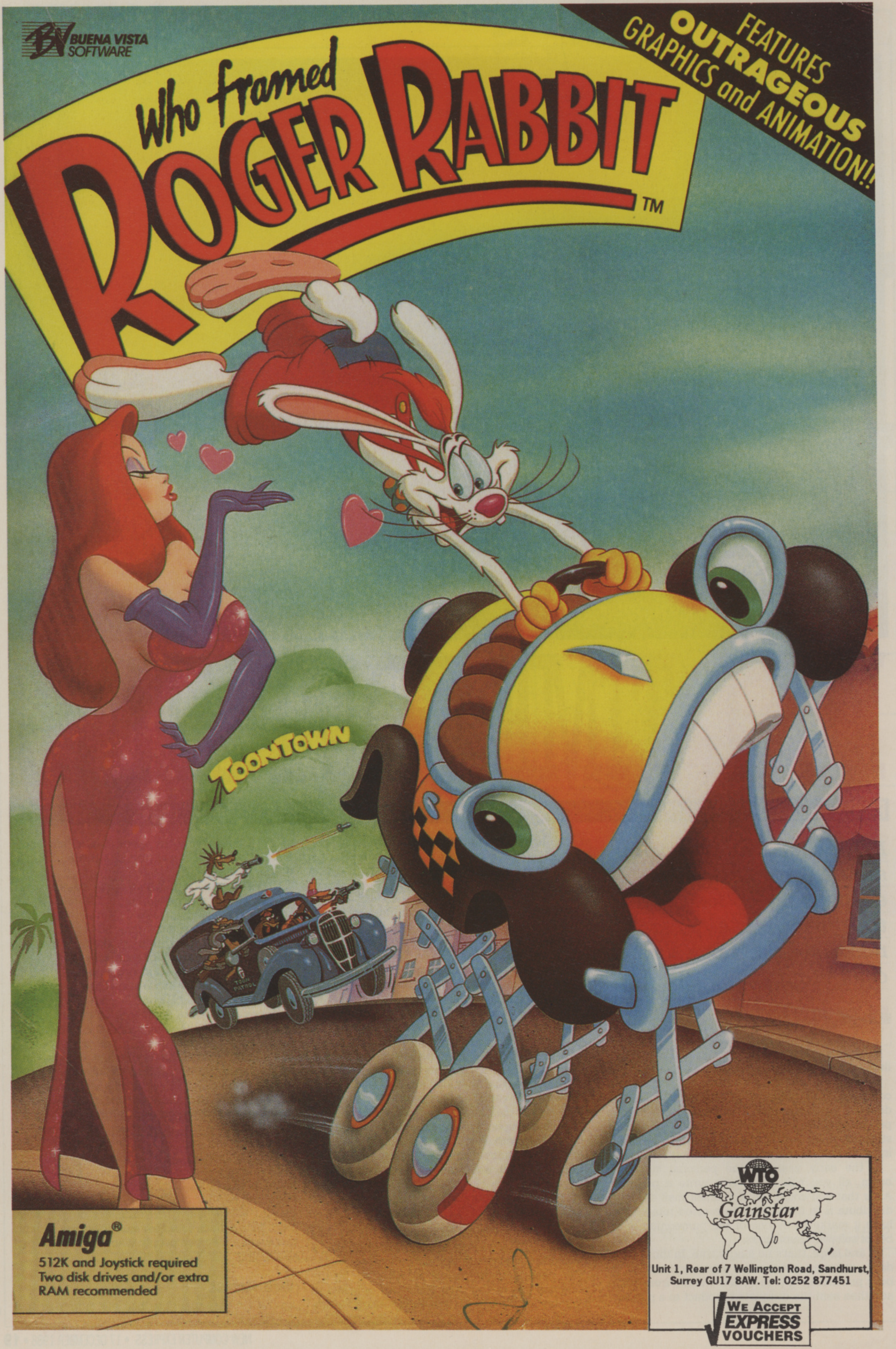
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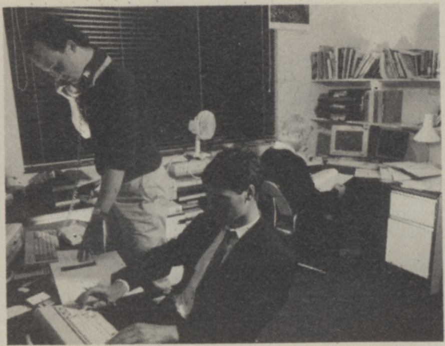


ing, computer entertainment has had to become more sophisticated. The days have all but vanished when featureless blobs whizzing about the screen could be explained away in a stream of breathless prose in the packaging.

Now, when the packaging talks about gleaming space cruisers bristling with gun turrets, the game-player wants to see gun turrets. When the packaging talks about slime monsters dripping venom, the game-player wants to see that venom drip.

In fact, in many games the graphics are pre-eminent.

But computer gaming requires special talents of the artist because you're working in a new medium. A strong portfolio of oils, or watercolours, or pencil sketches, isn't going to be enough – you need a portfolio of computer graphics. You need to understand how to work around the limitations of user-defined characters, how to animate sprites, and to understand the programmer's problems.

However, if you can combine the two – traditional art with computer techniques – you're ahead of the competition. Gary Bracey, Ocean's software manager, says, "Most of our artists are from a pure arts background and that tends to give them a different view of things than people who only know computer graphics."

It's no good coming up with a mouth-watering collection of graphics if it's technically impossible to implement them on the target hardware. Similarly, you don't have a free rein because of memory constraints – you have to leave sufficient room for the sound effects and for the actual program code.

Again, familiarity with more than one computer is a bonus. There'll always be a demand for someone who can produce eye-catching displays on an Amiga, but you win extra brownie points if you know how to butcher them so they still look good on a Spectrum.

The Musician

Music is increasingly a key part of the best games, but today it has to be original music. Two or three years ago there was a distinctly dodgy trend towards ripping off music from TV themes and pop hits – poor old Jean Michel Jarre was burgled several times.

The industry is now much more professional in its approach to music and other people's copyright, but that has increased demand for computer musicians.

One approach is to have a piece of music written and then sample it for inclusion in the game. This gives the most impressive results, but because of the huge amount of data generated by sampled sound it means that musical snatches tend be only a few seconds long.

The best bet is direct programming of the computer's sound chip. Jez San comments, "Sometimes we do original music and sample it, but it's better if the musician knows how to program the machine. Using tricks and coding it's possible to get longer pieces of up to five minutes."

Gary Bracey echoes the point: "We have one musician covering everything and he works like a demon. We could certainly use another but he's got to have a comprehensive knowledge of the different processors and sound chips, plus a knowledge of music, plus the ability to compose original pieces."

The Freelance Option

Although there is a definite trend towards team development, that doesn't mean you have to become a nine-to-fiver. Although many companies insist on in-house development, there is still a considerable demand for freelance workers.

Jacqui Lyons runs Marjacq Micro, an agency for independent programmers, artists and game designers, and makes the case for the freelance approach.

"The fundamental difference between full-time employment and freelancing is that as a freelance you are much better paid," she says. "You don't have security, but you do have the opportunity to earn some good money.

"An in-house programmer might earn £12,000 a year, whereas you can easily get £12,000 doing two projects a year which might take eight months.

"A really good coder taking four months to produce an 8-bit arcade game is going to earn at the top end of four figures. You might even get over £10,000."

As a freelance you can pick and choose your work, taking on only those jobs that interest you. You work your own hours, usually where you choose, and by and large you can work when you want or need to. The down side is that you don't get paid holidays, or paid sick leave, and you succeed or fail entirely on your own efforts.

However, provided you can live with the lack of security, and that you can take a thoroughly professional approach to the business – software companies won't work with unreliable people – freelance work has a lot to recommend it.

Lyons is confident about the prospects of work. "There's such a demand for 68000 coders, and I also think that's true of Z80.

"The C64 market seems to be oversubscribed at the moment, but I can't get enough 8086/MS-DOS programmers. There's more work than we can handle."

The situation for artists and musicians is less clear cut. "They are becoming more and more in demand," Lyons says, "but they are paid less. As a rule of thumb you can reckon on about £250 per week, but it can be a lot less."

The important thing to remember is that as a freelance you're effectively running your own business, acting as a sub-contractor to other companies.

That means you'll be dealing with contracts and other legal obligations – so keep a friendly lawyer handy.

What you could earn

The computer entertainment scene is still young enough for there to be hugely differing levels of pay in different companies.

One senior software figure said many programmers were either ludicrously overpaid or ludicrously underpaid – for four reasons:

"You've had a whole series of very amateurly-run companies whose understanding of what proper wages are was scanty to say the least.

"Some employers have exploited the fact that for many programmers, it's a hobby and they don't mind what they're paid.

"But then other companies have come in and handed out serious money in an attempt to buy themselves good people at whatever cost.

"Add to that the fact that some people are paid flat rates, others royalty only, others a mixture and you have a pretty chaotic situation. All manner of strange deals have been done."

Having said that, the increasing dominance of a few larger companies has induced some stability. So this is a rough guide to what kind of money you could expect.

If you join a software house or programming team from school or college you might start on a basic salary of £5-7000.

Within a couple of years – if you're any good – you could expect to be earning nearer £10K plus bonuses or royalites – the rates are fairly similar whether you're coding, doing graphics, music or games design.

A successful track record could take you substantially higher – and if you program a hit game for which you're getting royalties, you could pick up £5,000 or more in a single cheque.

However the number of games programmers consistently earning over about £20,000 a year is very low.

If you go the journalism route, reward prospects are fairly similar – staff writers after a couple years' experience could be on £10K or so – after that it's up to you!

The Game Designer

Superficially, the game designer's job may look the most attractive. When the programmers and artists are slaving over hot keyboards, the designer might be the guy with his feet on the desk, staring into space.

But there's more to it than that. Consider: you can take the best design in the world and ruin it with poor programming and second-rate graphics. And with the best programming and graphics, a poor design is only going to be adequate at best.

So the designer now has a key role in games production. But what qualifications does it take?

The designer doesn't have to be a programmer, but he or she certainly has to understand the basics of computer hardware because a design that can't be implemented is worse than useless. So you have to know what is and isn't possible.

What's harder to describe is an appreciation of what makes a good game: how to fit an original scenario into the limited range of stock formats – platforms and ladders, shoot-em-up, martial arts, and so on; what makes one game so-so and a similar game great; which aspects of the design really add to the game and which are mere dressing. In a word, what is "playability"?

There are no qualifications for game design, no college courses. All you have to do is come up with brilliant ideas. Most current designers, therefore, have reached their positions from some other area of the software business.

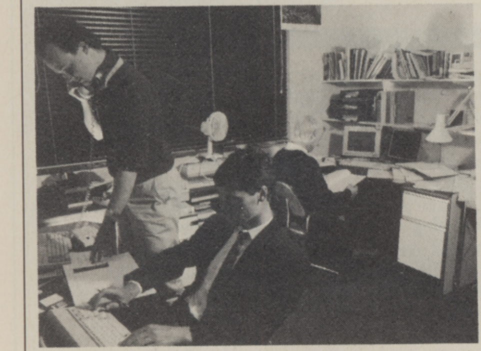
• Jez San: "...it's better if the musician knows how to program the machine."

The Manager

A dull title for what is an unglamorous but crucial job. Whatever title is used – project manager, product manager, team leader – this is the person responsible for making everything work, and for making it work on time.

Once a publisher is committed to a project, a lot is at stake. And there's more to it than just the technical side. The packaging has to be designed, artists commissioned to produce the illustrations, advertising to be organised, designed and ordered, tape and disk duplication to be calculated and booked, sales teams to be briefed and retailers to be convinced.

It can entail a lot of manpower and a lot of money. Things can go wrong at any stage, but everything depends on the programmers produc-



ing the game on time, and the programmers can't finish without graphics and sound data.

Any and all of this can be the responsibility of the project manager. How much depends on the size of the company.

The Journalist

A totally different career option is that of a writer on one of the many computer magazines. Many computer writers obtained their jobs without any formal journalistic training – but simply an enthusiasm for the subject and the ability to communicate that to others.

Jobs on magazines range from full-time reviewing of games or other software (not *quite* as idyllic as it sounds with an editor screaming at you for copy and you're stuck on the first screen) to production work in which you edit other people's words, write headlines, obtain relevant pictures, etc. (a position which is unlikely to be given to someone who's had little relevant training.)

Later, you can aspire to the grand heights of posts such as Reviews Editor or Technical Editor, and develop close contacts with key people in the industry.

Breaking in

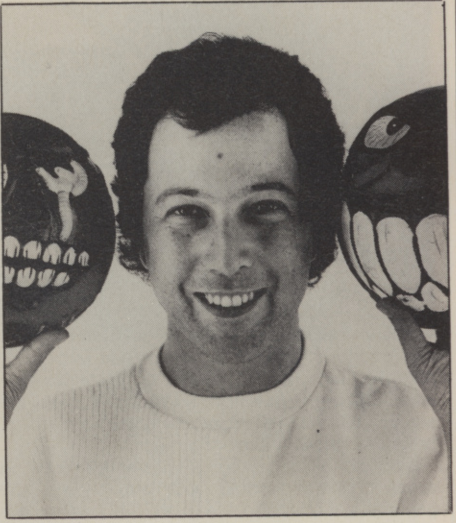
Getting started is not particularly difficult – *provided* you have two vital characteristics; talent and persistence.

First and foremost, you need something to show. If you're a programmer, people will want to see impressive code; if you're an artist you need some good graphics demos. Then it's simply a question of sending them off to as many people as possible.

Gary Bracey says, "We always ask for a demo of something impressive – multiplexing sprites on the C64, a good, finely-detailed scroll on the Spectrum, that sort of thing.

"Beyond the technical side, attitude is important – we are talking about a regular job and you have to take a professional attitude. Enthusiasm also counts for a lot. You often find good coders who are so jaded by the whole affair they lack that spark – the enthusiasm to put something extra into the game."

If you can bring the right qualifications, your chances are good. "The prospects are marvellous," Bracey says. "We're always looking for good coders and artists – the door is open." ●



• Gary Bracey: "The prospects are marvellous."

Where to apply

Tracking down the openings can be more difficult than it first appears because few of the big-name software companies do any programming – they are publishers and marketing operations rather than software development companies. Ocean (Tel 061 832 6633) is unusual in this respect – it has a team of around 30 programmers, artists and other creative staff.

Most software development is done by smaller, less well known teams of programmers and artists – companies like Argonaut, Realtime Graphics, Dalali and a host of others you've probably never heard of.

The best way to find these companies is to watch for adverts in magazines like *Express*, and the best-selling games mags like ACE.

On the journalism side, your best bet is to write direct to the magazine(s) of your choice, enclosing a sample of your writing (say, a review of a software package) and explaining what you have to offer.

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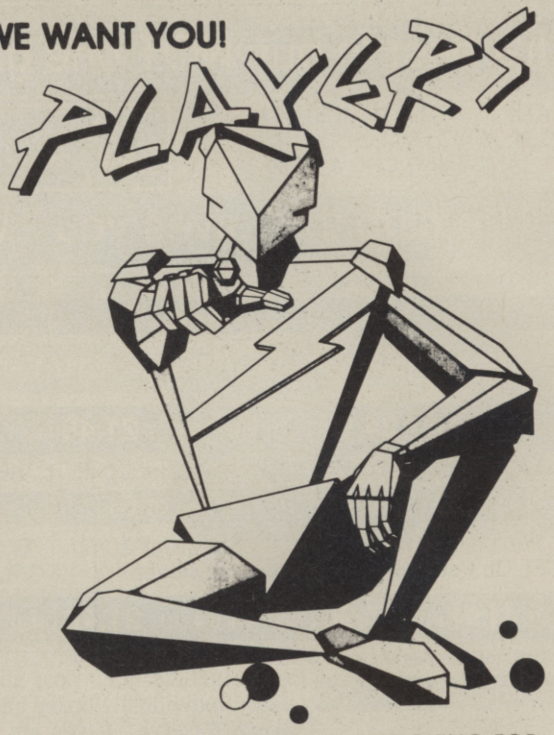

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A star is born

Part IV: In which William Poel explains the CPC's birth

There wasn't much time between the demonstration of the first CPC 464 prototype with the cursor responding to the cursor keys, and a prototype with an adaptation of Locomotive Software's *Mallard BASIC* arriving.

Meantime, the decision to stuff as much of the stray logic into a gate array was made from the combination of several factors:

1) There was a growing shortage of low power TTL logic ICs due to the cyclic nature of the business and the boom in micro computer manufacture.

2) The complexity of a discrete logic board meant that a substantial saving on ICs could be made, a saving reflected in assembly costs and reliability as much as in parts costs.

3) A custom logic array device would provide a better degree of immunity against casual rip-offs in the Far East where the machine was to be made.

Amstrad's first home-grown custom logic array also gave Alan Sugar a warm feeling, as it would signal to his manufacturing partners in the far east that Amstrad was indeed moving up a gear in terms of technology. The oriental folk were duly impressed, as the specification of the CPC 464 was indeed ambitious given their understanding of the background of Amstrad's audio and TV products.

Stuff the press

The initial success of the CPC464 brought in a flood of accolades from the computer press. Amstrad's view of the specialist press had been unprintable as a result of the less than encouraging encounters in the hi-fi days. Alan Sugar had erected a barrier of bravado to protect the morale of his staff from the depressing effects of such criticism, which had been a major factor contributing to the less restrained "stuff 'em" attitudes which the press found so distasteful.

However, a few paragraphs of glowing praise were enough, and Alan Sugar discovered just how warm it felt to be the idol of the press, and so strenuous efforts to court their favour were made. In fact, the honeymoon lasted a long time.

Attention to public relations for the CPC market was given through the launch of the Amsoft operation, which arose as a result of the way in which Alan Sugar accepted advice that the home computer industry was a different animal to the consumer electronics business he had hitherto understood.

The GAS board cometh

MEJ Electronics tackled the gate array with typical candour and a professional approach to engineering that uncovered the deficiencies in one of the chosen gate array suppliers' design and development practices. All the more astonishing, since that company had been held up as a beacon of British ingenuity and an example to all in the development of custom gate array technology.

Within a far better than average time, Marc Jones and Mike Scaise, then pretty much the whole of MEJ Electronics, had completed work on the Gate Array Simulator (The GAS board, as it was fondly known) and got to a working state with the first samples.

The bottom line was that the yields of the gate arrays were low, and the supplier wanted to put the price up to cover for this problem. A yield of around 15-20 per cent working devices was considered acceptable if unexciting. So with their usual caution and pragmatism (that had not been much in evidence at Sinclair and Acorn, which had suffered its own well-reported problems with gate arrays, largely attributed to the fact they had remained with a single source of supply), Amstrad was unimpressed by the performance of the suppliers over the next few months. It quickly commissioned MEJ to procure an alternative in a different technology from another European company.

Meantime, Locomotive steamed along with the software. The firmware of the CPC464 was created in a very structured and systematic approach that is a hallmark of the way Locomotive works. The specification was written, and then the software was produced to match the specification: a fundamentally more professional approach than many microcomputer manufacturers had seemed to adopt up to then.

This orderly approach had a side effect in that it was easy to produce the firmware manual in good time. The first "public" prototypes were duly shipped with more documentation than just about any of the invited programmers had ever seen before from any micro maker, let alone one that came with all the foreboding of the name of Amstrad. Hitherto, it was not renowned for its attention to this type of detail.

With Amsoft, Amstrad had grasped what people like Texas, MSX and other had failed to grasp, and that was the benefit of creating a total support operation to give the users the comfort of a user club. Various meetings were held with the then publishers of computer magazines to try and interest one of them in providing the "official" Amstrad computer magazine, but at the early stages of the project, they all turned the idea down flat.

"We'll wait and see" was the response. Which was pretty fatuous, since it seemed obvious that the success of the project would be enormously enhanced by the right sort of monthly magazine to boost the CPC marketplace. Most said that for a fee of around £20,000 they might deign to produce a pilot issue, but those of us who felt strongly that the CPC was going to succeed were irritated by this response, and decided to do something about it.

• Sugar: The boffin-bashing begins...

Hours not to reason why

The CPC 464 launched in April 1984 – a remarkably short gestation period for a product which started from scratch only some eight months earlier. It was just as much a tribute to the long hours of effort put in by the contractors as to the "Sugar magic", so it came as something of an irritant to the workers on the project when Alan Sugar began his round of boffin knocking, and general belittling of those who were obliged to work long into the night, implying that such circumstances were a reflection of basic ineptitude if the job couldn't be done in the hours of 9 to 5.

Well, those engaged on the project were certainly boffins in the terms of Amstrad, and if they had downed tools at 5.30 pm like the rest of the Amstrad, then the CPC 464 might just have reached the market by Christmas 1985. At that time, the concept of overtime at Amstrad was an anathema, since in common with many other suspicious companies, the feeling was that if overtime was available to staff, then they would spend the day from 9 to 5.30 stirring their tea, waiting for double time to start. To those who were dedicated to their task this was obviously faintly insulting, but most had learned to take the rough with the smooth when working for Amstrad. Persons of nervous or delicate disposition do not last very long at Amstrad.

World of support

To those at Amsoft, it was very much a chicken and egg situation. Utterly out of character, Alan Sugar and his marketing manager Malcolm Miller, saw the benefit in supporting Amsoft's desire to provide the total support package that the Spectrum and BBC marketplace would not.

So an initial 32 page "newsletter" that appeared in September as a result of the spare time efforts of the Amsoft staff (some of whom had previous experience of launching specialist publications) blossomed into a full blown colour magazine by November. Some Amstrad executives found all this very hard to swallow, it being completely out of character with their past, but they all came along for the ride and were generally tickled pink to read the monthly .

As the success of the move into computers became apparent, those who had stuck their necks out to support Alan Sugar heaved a sigh of relief, and those who had expressed reservations jockeyed for position in the new computer operations. Who wouldn't rather be associated with a success like the CPC464, than a less critically acclaimed range of tower audio systems?

The CPC464 project had clearly changed the way Amstrad was being perceived by the public, and this was to have far reaching consequences that lead to their on-going love affair with computers.

In Alan Sugar's own words from an article in the *Daily Mail*, the company's edge is brought about (amongst other things) by a form of "confrontational" commercial aggression. Handling this is an art which Alan Sugar has generally mastered, but many of his famous band of clones have yet to manage without irritating everyone they encounter. When visited by an Amstrad person, one journalist once joked that Amstrad people should plant their visiting cards on the numbed body of their "victims" on the way out, with the immortal phrase borrowed from Chelsea football fans:

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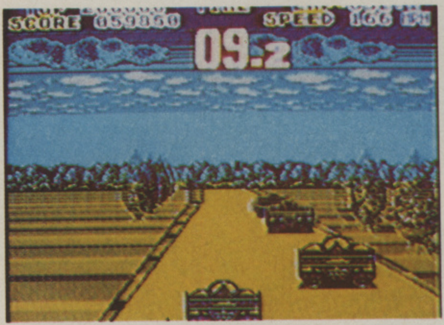
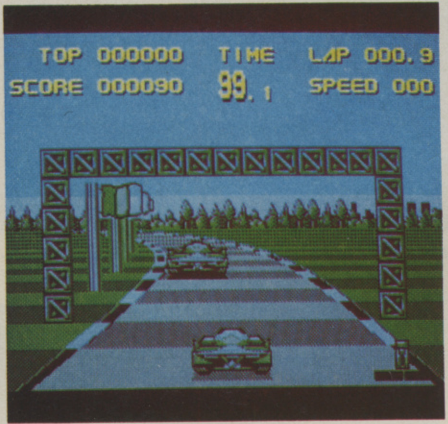
Life on the Ocean wave

Rik Haynes justifies his latest extremely extravagant expenses-paid expedition to Ocean by previewing its latest games, including* Orion's Belt*, an Express exclusive...

WEC LE MANS OCEAN

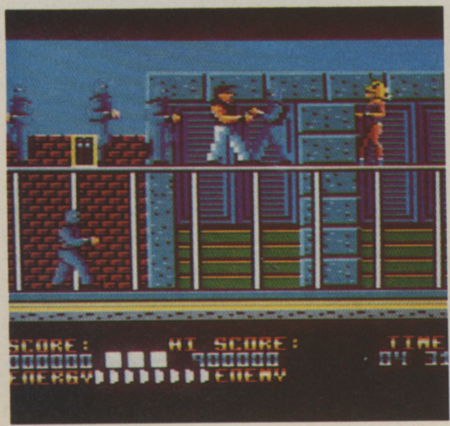
Based on Konami's popular racing simulation coin-op, you drive around France in a tiring 24-hour race, travelling through town and countryside avoiding road hazards and the inevitable Sunday drivers. We've played the early version and it looks great, complete with a superb crash sequence with your car tumbling head over heels when you crash. Seen here on the Spectrum and CPC.





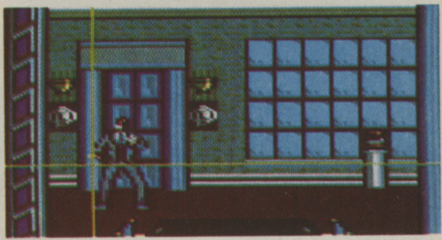
DRAGON NINJA OCEAN

Another shot of the martial arts coin-op conversion on the CPC, with you kicking and punching your way through the scum and slime of the city's sewers, in a bid to rescue Mr President (who'll reward your efforts with a hamburger – big deal!). There's not much else to say – except where's those review copies?



ROBOCOP OCEAN

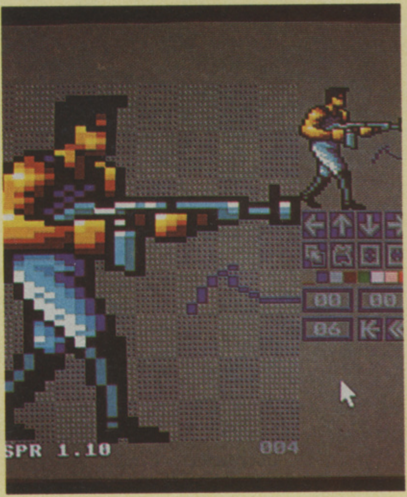
Coinciding nicely with the recent release of the movie on video, Ocean now gives you the chance to play the robotic cop himself, in a multi-level romp through the criminal haven of futuristic Detroit, seen here on the CPC. Luckily, you've got the help of your personal peripherals – and a handy blaster.



(THE GAME WITH NO NAME) OCEAN

This game's so new it's still on the drawing board – well, sprite editor to be exact.

It seems that when one of Ocean's in-house team of 12 graphic designers has some time to spare, that time is put to good use by designing graphics which can be used in future releases. So when you see this sprite in a forthcoming Ocean blockbuster, remember you saw it in *Express* first... (*Whatever next – sound FX exclusives? – Ed*)



ORION'S BELT

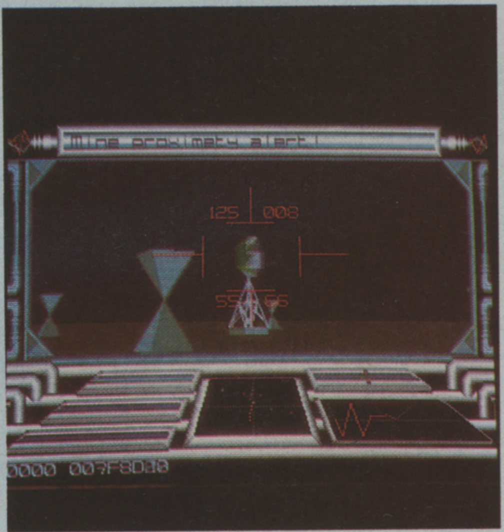
(Provisional title)

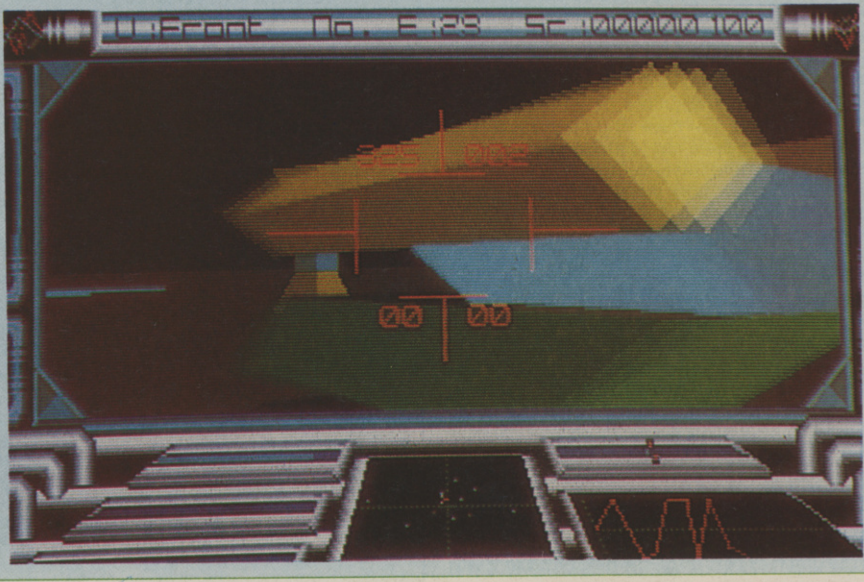
OCEAN

Battlezone meets *Starglider II* in this super smooth and slick filled 3D graphic, strategic blast-em-up (shots from an ST). Taking the helm of a manoeuvrable futuristic tank, you'll have to crush singlehandedly the alien force gathering on the eight moons of Saturn before they finish preparing their invasion force for good old Mother Earth.

Along the way, you'll scoop up all sorts of goodies such as decoy missiles (gives the enemy something else to shoot at), remote-control cameras (you can even watch yourself) and a really sooper-dooper scoop allowing you to change into a skimmer.

Unfortunately, you'll also meet all sorts of hideous and ingenious adversaries, including a strange and sinister spider-like craft. In fact, the only bad thing about the game is the wait – it's not out 'til February.





Realtime Secrets

Andy Storer treks up to Leeds to get the inside story on 3D masters Realtime

Since selling its first game Tank Duel from a payphone in a student hall of residence, Realtime has arguably become the country's most prestigious solid 3D graphics company. *Carrier Command* and *Starstrike* have placed the founding trio Ian Oliver, Graham Baird and Andy Onions at the forefront of games development. They met whilst studying Computer Science (inevitably!) at Leeds University, and are still based in the city.

After converting *Starglider* to the 8-bits and *Elite* to the PC, Realtime released *Carrier Command* onto a 16-bit market where its excellent technical accomplishments were matched by its sales. PC and 8-bit versions for *Carrier* are on the way, and a new project, *Tank Command*, is nearing completion.

• Realtime's Ian Oliver masters the Tandy PC version (left) of Carrier Command on a Compaq 386 (centre) with separate debugging screen output running through a Dragon 32 (right)!

Through Realtime and space

Carrier Command's multi-viewpoint, filled vectors proved beyond doubt that Realtime knows as much as anyone about Solid 3D programming – and probably more. So how would they go about writing a game that featured fast movement through a solid 3D environment – say a flight through Leeds City Centre?

Over a lunch of Mexican enchiladas Oliver and Baird revealed their approach:

"The first thing you have to do is sort out how you're going to store the data so you can both draw it quickly and travel through it as well. Then you need to know how you're going arrange the objects in memory so the graphics system can access them efficiently and also so that the Runner (the point-of view you control), can access them efficiently.

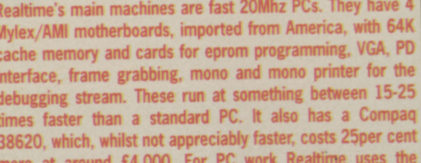
"For a city centre, you'd need an array to store the position of all the objects in such a way so you can look through them and work out which ones are close enough to be in view. You don't want to have to process every single building every frame. This is independent of the actual design of the object. You have to decide which objects you must draw in detail and that's dependent on their distance from the viewpoint. Then you can go on to say this is what you draw and this is how you do it – what we call the graphics system. And then you write the gameplay.

"The graphics part is the trickiest part but it isn't the longest. *Carrier Command*'s system was 80 per cent finished within six weeks: the rest of the year was taken up with gameplay. You have to make those graphics fun to play with.

"Dealing with multiple viewpoints is so easy – we could go back and change one line of code in *Carrier* and set up a new viewpoint, for example. But the most difficult thing is the amount of data you have to keep expanded up for every viewpoint. Just because you're not seeing something happen doesn't mean you don't have to account for collision detection and tactics. The actual switching is easy – you could flick to another viewpoint in a quarter of a second to deal with action the equivalent of thousands of miles away. It's the process of running multiple games where the processing time mounts up. On *Carrier*, we had to limit the level of simultaneity by restricting

Gear

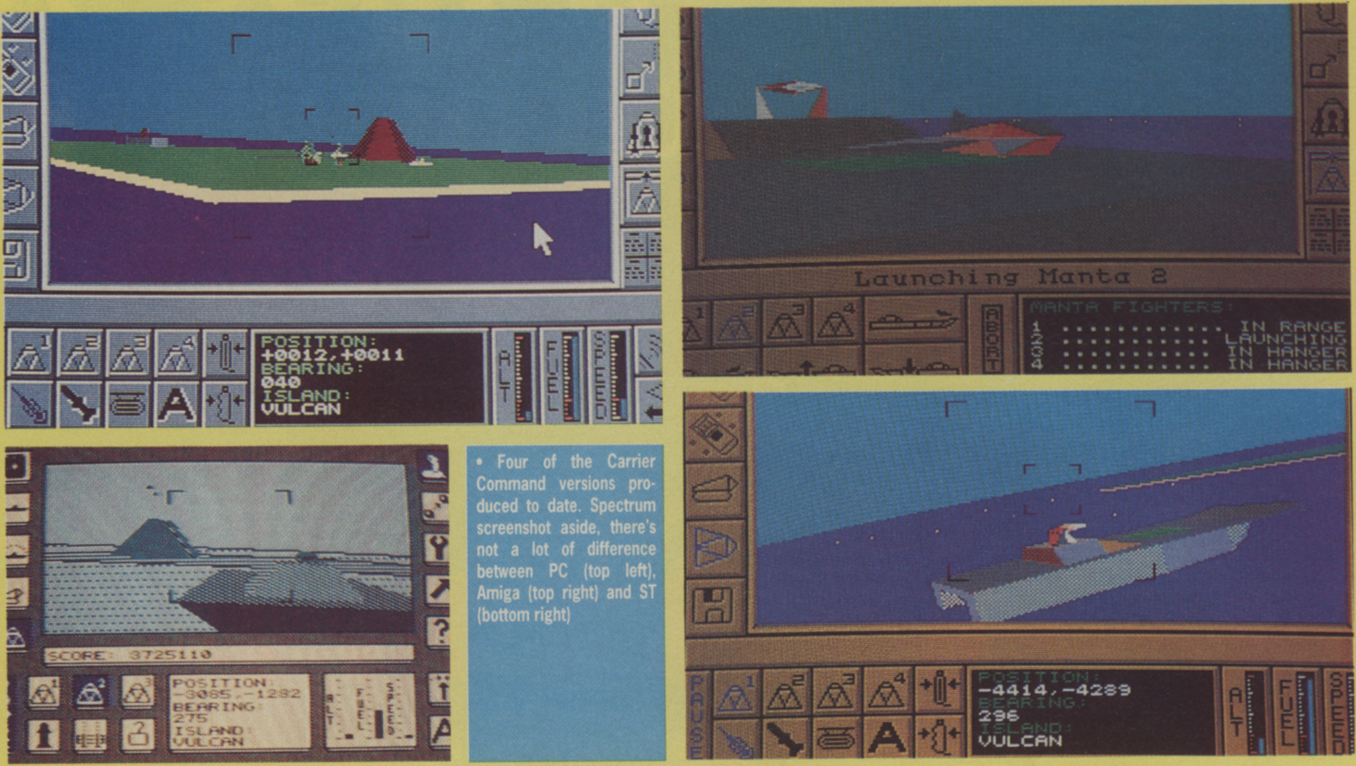
Realtime's main machines are fast 20Mhz PCs. They have 4 Mylex/AMI motherboards, imported from America, with 64K cache memory and cards for eprom programming, VGA, PD interface, frame grabbing, mono and mono printer for the debugging stream. These run at something between 15-25 times faster than a standard PC. It also has a Compaq 38620, which, whilst not appreciably faster, costs 25per cent more at around £4,000. For PC work Realtime uses the *Optasm* assembler by SLR systems(around four times faster than the Microsoft assembler) along with a Borland linker. For editing the Realtime team use *Brief* by Underware (funnily enough!).



• A close-up of the innards of a Mylex/AMI with a selection of onboard cards

Pirates

"We didn't protect the disks for *Carrier* on the ST or Amiga so there's only the manual protection to take out, which is relatively easy. We know of commercial product that features our source code – polygon fillers, say. Whilst we've got nothing against people taking our games apart and looking, we do object when they lift code directly. It's a question of pride in your work: if you need to rip out code wholesale, then all you're going to come up with is mediocre games. You can't really cut it."



• Four of the Carrier Command versions produced to date. Spectrum screenshot aside, there's not a lot of difference between PC (top left), Amiga (top right) and ST (bottom right)

the number of islands and vehicles available for use. Otherwise the game would have just stopped.

"It's easier to incorporate multi-viewpoints if the area of play is smaller – say switching views between aircraft flying in formation. Then you'd only have one model and they're all in the same 'game' and completely interactive. Two views of the same action is fairly simple, three or four get more difficult: there's nine in *Carrier Command*!

And so down to the coding

When they were students, the Realtime crew programmed everything from 4 to 36 bit (DEC 10) processors, so they haven't exactly come from learning Z80 code to this level of expertise.

"We now work on the fastest PCs we can get our hands on and run a cross-assembler which assembles and then downloads the result to a machine we actually want to run it on. But we learnt the hard way.

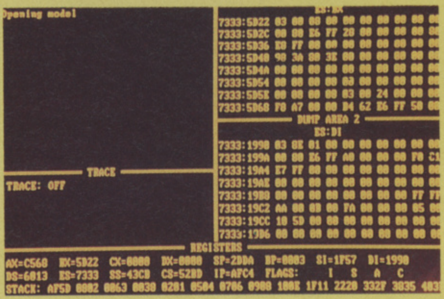
Carrier took just over a year: it was our first 68000 program, developed on an ST using *Devpac.* The first version was atrocious and disgustingly slow. Our 55,000 lines of code was taking six minutes to assemble, so we'd often forget what we'd done by the time it finished.

"On the PCs we use now, the same code assembles in less than 25 seconds. You see, the ST and Amiga aren't high performance machines. They weren't meant to be serious computers designed to run utilities for major projects, their hard disks aren't that fast and in any case *Devpac* wasn't designed to assemble that size of code. You need to be able to turn something around in 30 seconds or so, otherwise programming becomes a real pain – you just can't get the feedback you need. So we use machines of the power of a Compaq 386.

"The first thing we do when we want to produce a machine version of a project is fit an interface for our development system. We only actually create anything on a PC – it's all sent down the wire. We throw out the operating system of whatever machine we're writing to – and we write to STs, Amiga's, other PCs, Macs, PCWs and all the 8 bits – and go straight to the hardware. A boot disc just hooks it straight into our parallel link software. Ironically, this works fine on everything except the PCs. They all work differently since there are tens of thousands of different PCs in the world and the only one we specifically check for is the Amstrad, which is the most different of the lot!

"We try and put one person on each version of a game and all start at the same time. It's too hard sitting around waiting for other people to finish updating files the whole time. It's okay at the beginning for sorting out problems, but you get more efficient code if you work alone!"

• The PC version of Carrier running on the Compaq can display 4 different viewpoints simultaneously



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                         7333:5D40 90 3A 00 3E 00 00 00 00 00
                         7333:5D4A 00 00 00 00 00 00 00 00 00
                         7333:5D54 00 00 00 00 03 00 00 00 00
                         7333:5D5E 00 00 00 00 03 00 24 00 00
                         7333:5D68 F8 A7 00 00 D4 62 E6 FF 50
                         ──────── DUMP AREA 2 ────────
                                     ES:DI
                         7333:1990 03 8E 01 00 00 00 00 00 00
                         7333:199A 00 00 E6 FF A0 00 00 00 F0 C1
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TRACE: OFF               7333:19AE 00 00 00 00 00 00 00 00 00
                         7333:19B8 00 00 00 00 00 00 00 FF
                         7333:19C2 AA 00 0B 00 FA 00 00 00 05
                         7333:19CC 10 5D 00 00 00 00 00 00 00
                         7333:19D6 00 00 00 00 00 00 00 00 00
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STACK: AF5D 0002 0063 0030 0201 0504 0706 0908 100E 1F11 2220 332F 3835
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• Designing great games is one thing, but you also need quite a head for figures

The future of games

STs and Amigas are billed as the future of games computing with their advances in memory, palette and power. Are they the real thing for Realtime ?

"There aren't many games out that use the full power of an ST or Amiga. Using the full memory is easy but even *Carrrier* doesn't use anything like their full power: the most accomplished title you could name probably only uses five per cent of the power available. It doesn't really boil down to the power of the processor – it's the amount of memory you've got that matters.

"Sprite-based games on the 64 can almost emulate anything written for the ST and Amiga, but there's no real advance on the 16-bitters as far as those type of games are concerned. Okay, you definitely get better things on the more powerful machines but in some ways it's too easy to do things on them, and until people 'up the ante' it's going to remain like that. But then you don't need state of the art this or that. Take a game like *Tetris.* You only need great gameplay to make a great game – you could almost do *Tetris* on a Psion Organiser.

"At the end of the day, people want a damned good game with the graphics representing it, so we're not interested in producing flashy demos. It's misdirected energy."

"In terms of solid 3D there's only a few per cent more advance to be had on home machines since they spend most of their time filling polygons by putting bytes on the screen. With more processing speed you can get more facets of an object per screen. *Carrier* has a top rate of 105 or so but really at the moment all we're talking about is enhancing those aspects which already exist. We're going to start doing lightsource shading, more realistic lighting and colour effects but the problem is the number of colours you've got available.

"The main advance will be in using the machines in new ways – lightsource only takes a bit more processing."

Future perfect Realtime

"We're in a position where we can do exactly what we want – we're totally free – we wouldn't sign a contract where we weren't. We only look a few weeks in advance so we can't really say at the moment where we're going next. But it'll be solid 3D for the time being." ●

You just wo
what they're sa

Thunde

"Plays just like its coin-op parent."
The One.

"Prepare for take off in December and look for this High Flyer shooting straight for the top."
Your Commodore Games Special

"The conversion is EXCELLENT"
"The graphics are fast and IMPRESSIVE."
"Bags of entertainment blasting through the stages."
ACE Magazine
Christmas '88
Special issue

"I can finally see what all the fuss was about. Thunder Blade isn't just impressive technically, in the playability stakes it's tremendously addictive."
"A must for the arcade machine lovers."
Crash Smash 91%

"With tanks, aircraft and lots of generally offensive beggars hanging around everywhere, the whole game becomes a myriad of fast paced-action and lots of good graphics."
"All the great arcade action has been left intact."
ST & Amiga Format 92%

"Thunder Blade is the sort of game its fans will love – by which I mean that those who thrill to 8-bit conversions of coin-op arcade games will need no further recommendation."
Amstrad Action

"The HOTTEST conversion this Xmas by far." C.C.I.

Believe it! Buy it!

n't believe
aying about...

r Blade™

"Mega game." C.C.I.

"Each time US Gold produce a coin-op conversion, they set a new standard of excellence which makes life a little more difficult for other software developers. Thunder Blade has established our faith in coversions for the ST.
As we have come to expect from the pride of Birmingham, this is a faithful reproduction of the arcade version – explosive and brutally competitive!"

ST Action – February 1989.

"An ESSENTIAL addition to every '64 and Amiga owning blast 'em up fans software library."

Commodore User.

ACE RATING

Spectrum Version
Thunder Blade 793
Afterburner 656
CBM 64/128 Version
ThunderBlade 800
Afterburner 519

"Thunder Blade is
100%
FABULOUS."
Amstrad Cent Pourcent Magazine

"US Gold has done an excellent job – watch out for it!" Sinclair User

"The Spectrum version is superb – there is definitely no choice when considering this or Af...b...er – we'd go for Thunder Blade every time."

New Computer Express

STOP PRESS
Thunder Blade goes platinum and sells over 100,000 units in Europe in just 5 days!

Play it! The No1!...

Welcome to *New Computer Express's* games section, the liveliest, most up-to-the-minute reviews for miles. Here's what we offer that other magazines don't. We:

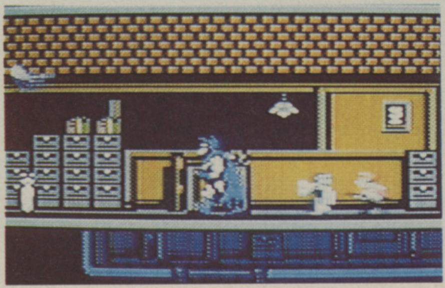
- make sure more than one person sees each game, so that the verdict can be relied on.
- avoid the shoddy practice of basing 'reviews' on unfinished games.
- break up reviews into easily-digested sections relating to scenario, gameplay, graphics etc. – no more hunting to find out what you want to know.
- take version differences seriously. You'll always know what machine the game's being reviewed on, but we'll give you information about other versions too.
- use a simple, no-holds barred, no-fuss star rating system, where only the very best games get the coveted five-star rating.
- give games of particular significance their own box, together with a flash to say what's different about them.

BATMAN

OCEAN

C64 • £9.95cs, £14.95dk
Also on Spec, CPC
Out soon on ST, Amiga

***Batman* the TV show is back in vogue again thanks to the television shows *Night Network* and *TVAM* (but then again anything would shine in comparison to those dreadful programmes). And flying on the back of that new found cult status comes the computer game, a mix of arcade adventure and beat-em-up, encased in a comic-strip type environment.**



• C64: Overlaying screens give comic-strip appearance

● GAMEPLAY

Taking on the role of the old caped crusader himself (Robin the Boy Wonder's been kidnapped) you play through a two-part scenario encountering The Penguin in his umbrella factory lair, or tackling The Joker in his familiar territory of a fun-fair. Either way, you start your adventure in the Batcave.

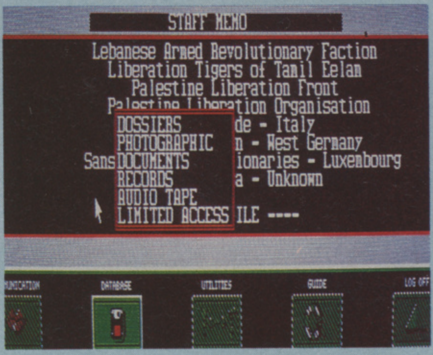
During play you not only control *Batman* in the flesh but can also flip into an icon-driven system for manipulating any objects that you find on your travels. As you progress through the various locations you meet plenty of crims, but you'll be able to dispatch them with your Batarang – among other things.

Just remember, it's your duty to protect the decent and honest citizens of Gotham City, and their safety is in your hands...

THE PRESIDENT IS MISSING

MICROPROSE

ST • £24.95dk
Already out on C64 and PC
Due out on Amiga



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STAFF MEMO
Lebanese Armed Revolutionary Faction
Liberation Tigers of Tamil Eelam
Palestine Liberation Front
Palestine Liberation Organisation
         DOSSIERS        de - Italy
         PHOTOGRAPHIC    n - West Germany
     Sans DOCUMENTS      ionaries - Luxembourg
         RECORDS         a - Unknown
         AUDIO TAPE
         LIMITED ACCESS  ILE ----
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• Windowing into a world of insidious intrigue

Investigations are nothing new in game scenarios – one could argue the entire adventure game genre to be one long analytical process. But in *The President Is Missing* you're dealing with an interaction demanding quite a different approach to the usual look, examine, take and use formula.

● GAMEPLAY

You've become a controller of other adventurers, collating and assessing information before commanding them to implement your decisions. You have 8 field agents to assist you in locating the whereabouts of The Pres and his entourage, who've been kidnapped by an elite terrorist outfit.

What's more, it's thought to be an inside job. For your perusal are a number of dossiers on possible suspects, a range of aerial and satellite photos which may be magnified, audio evidence tapes and updates of the developing world crisis. It's your task to open a case file and, after studying various data, begin to assign field agents to follow up the leads. They will report back to you with their progress.

If your hunches turn out to be grounded in fact, you can notify the State Department to detain and question the suspect officially. But the reports you receive will include new information requiring further analysis, so you and your agents are going to be kept very busy.

The most valuable info is found in coded form, so there's quite a bit of cracking involved too. As if this weren't enough, you have Federal Data Bases, Agency Reports, Government documents and a whole host of other classified files to get your teeth into.

By updating your case file as evidence is deemed pertinent, you'll eventually identify the plan, execution and aftermath of the abduction, reveal the identities of the persons directly or indirectly involved, and thereby expedite the recovery of the President et al. Hopefully.

5
GAME

● GRAPHICS AND SOUND

The President is Missing is a mouse-driven icon 'adventure' featuring excellent use of digitised photographs to depict dossier suspects and locations. Of special note is the magnifying facility for 'blowing-up' detail and thereby searching locations for clues – this is effected by cursoring onto the area of interest. Otherwise all other data is presented on a series of overlapping information windows, save for the audio evidence, which comes on cassette.

● OTHER VERSIONS

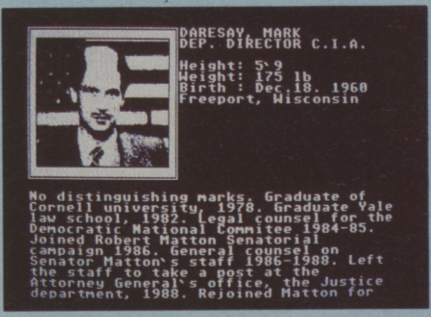
Both the C64 and PC versions are admirable renditions of the game – but this is no surprise, since apart from the digitised info there's no graphics data to speak of.

● EXPRESS VERDICT

An intriguing outing that's designed to provide you with an insight into how intelligence gathering works. By the time you've completed it, you'll have a good grounding in investigative procedure. Besides that, it's fun, and should have you hooked for ages.

✪✪✪✪✪

Andy Storer



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DARESAY, MARK
DEP. DIRECTOR C.I.A.

Height: 5`9
Weight: 175 lb
Birth : Dec.18. 1960
Freeport, Wisconsin

No distinguishing marks. Graduate of
Cornell university, 1978. Graduate Yale
law school, 1982. Legal counsel for the
Democratic National Commitee 1984-85.
Joined Robert Matton Senatorial
campaign 1986. General counsel on
Senator Matton`s staff 1986-1988. Left
the staff to take a post at the
Attorney General`s office, the Justice
department, 1988. Rejoined Matton for
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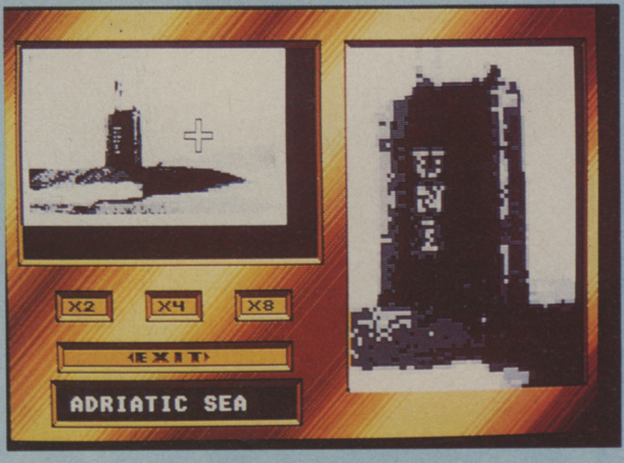
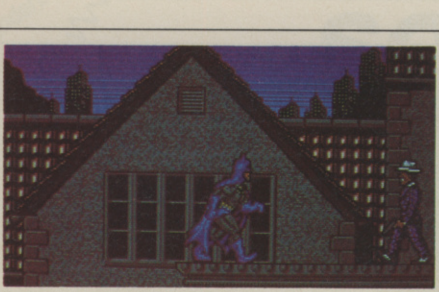


• Checking out the photographic dossier to search for hidden details (in the sub-text?)



• A sneak shot of Batman on the Amiga

● GRAPHICS AND SOUND

Batman is very pleasing visually, with nicely defined and animated sprites and good backdrops. By far the most innovative aspect is the display system – complete with overlapping screens – which greatly improves the impression of actually playing in a comic-strip.

Sound is slightly less impressive – but still up to a good standard, especially the rendition of *Batman*'s infamous soundtrack, which you keep on humming hours after you've finished playing the game.

● OTHER VERSIONS

The Spectrum version compares favourably to the C64 outing, albeit with fewer colours and less exciting audio. We haven't seen CPC *Batman* yet, but the ST and Amiga versions are here shortly and they're looking great.

● EXPRESS VERDICT

Fans of *Batman* will not be disappointed. It's a good arcade adventure which conjures up the atmosphere of the TV show and comic well. There are plenty of locations to visit, things to collect and criminals to Zapp – so lasting interest shouldn't be a problem either. But, for us, the most interesting feature was the blip-vert of the *Batman* logo between each location – acid or what?

✪ ✪ ✪ ✪

Rik Haynes

HELL BENT

NOVAGEN

ST • £19.95dk
Due out on Amiga

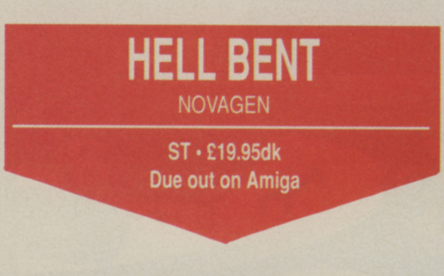
To stress that this game's ten levels have distinctly different graphics and play tactics, *Hellbent*'s been advertised with the question "One Game or Ten?". To which we can only reply, "One Star or FIve?"

● GAMEPLAY

You control a skimming fighter over vertically-scrolling terrain in a bid to destroy an indicated number of ground targets to gain access to the next level. You'll need to replenish your fuel and shield supplies by running through silos whilst firing at obstacles and enemies.

Simple eh? Well, sort of. Each level requires variations in skill on the same theme – e.g. blasting routes through, navigating a obstacle courses – all the while trying to stay cool in the face of progressively more aggressive adversaries.

Control is by joystick, with forward/backward movements delivering rapid acceleration up or down the screen. Left/right manouevres are effected by...well, we won't insult your intelligence.



• Heading up-screen for the safety of a shield silo

● GRAPHICS AND SOUND

Hellbent's visuals are certainly impressive. Scrolling is smooth, even at its highest rates, along with the animation of adversaries. There's even a secondary parallax scroll on some levels, which enhances the overall quality of colour and texture. The intro music is distinctly 8-bit, though, and the spot effects merely adequate.

● EXPRESS VERDICT

Maybe we've all been here before with *Goldrunner* and *Uridium*. *Hellbent* is in no way original, despite differences in gameplay levels. But it is addictive – even if that's largely based on a desire to master its finnicky control, and learn the best navigation routes. One for confirmed up-screen scrollers only.

✪ ✪

Andy Storer

OPERATION WOLF

OCEAN

ST • £19.95dk
Already out on C64, Spec, CPC
Due out soon on Amiga, PC

Great on 8-Bit!

All the 8-bit conversions are of a high standard in both the gameplay and audio-visual departments. The Spectrum version has great monochrome graphics, good spot sound-effects and flies along at a speedy pace. The C64 has the best sound-effects – but is the slowest – out of the 8-bits, and includes some first-rate visuals as well. Overall, the CPC's visuals are the most impressive out of the 8-bits – and it plays the fastest – with colourful and very accurate sprites and backdrops, but is a little letdown on the audio side.

Ocean bills Taito's *Op Wolf* as the world's no. 1 coin-op of the year, and judging by the number of arcades and pubs still resonating from its machine-gun fire they could well be right.

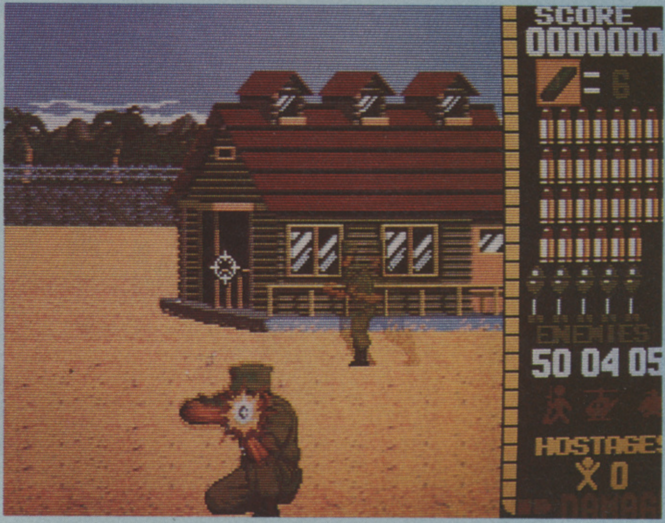
● GAMEPLAY

There are six stages of slow scrolling, murderous mayhem in which millions of enemy soldiers, tanks, helicopters and gunboats do their best to send you AWOL forever.

With machine gun and rockets in hand, you make your way to stage five, rescue the hostages and escape in the getaway plane parked in stage 6. While taking out everything that moves, you must collect ammo that just happens to be lying around to replenish your stocks. Otherwise your state of health deteriorates alarmingly – even more so if you hit any of the civilians and nurses running around scenes of combat.

TOO SLOW!

You can restore your health by shooting at medicine bottles in the foreground, and if you're lucky you might get to pick up dynamite for a smart bomb effect.



• Standing in the firing line can be seriously detrimental to your health...

Cursor targetting and control is by mouse, with the left button for machine gun and the right for grenades, rockets and dynamite. Gameplay ends when you're shot to pieces.

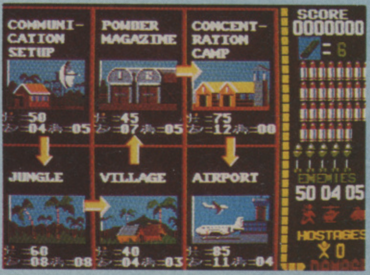
● GRAPHICS AND SOUND

Coming on three disks, *Op Wolf* features very chunky sprites against rich textured backgrounds. Inter-level digitised speech also works effectively, whilst gunfire and explosion spot-effects add a convincing edge to the carnage. But the big let down is the speed of animation – whilst the sideways scrolling is steady enough, the speed of your adversaries is decidely slow.

● OTHER VERSIONS

The CPC is the most colourful and fastest of the 8-bit versions, though the Speccy and C64 outings are pretty good efforts too. The Amiga version is almost complete and promises to be almost arcade quality.

● EXPRESS VERDICT



• To come – stage after stage of squelching slaughter

Operation Wolf could never be just another shoot-em-up – it's already spawned a number of clones – but this ST version would be a disappointing choice if mass murder is your favourite pastime. Disk swapping gets to be a drag, control is sluggish and it's just too slow. But then again it's still pretty difficult to complete, so you might think the lack of pace is a Godsend.

✪ ✪ ✪

Andy Storer

WHO FRAMED ROGER RABBIT

BUENA VISTA SOFTWARE, USA

Amiga • £29.99dk

Straight after the release of the brilliant movie (what do you mean, you haven't seen it yet?) comes the computerised version, promising fantastic audio-visuals. Let's hope the gameplay reaches the same high standard. The game is imported by Gainstar, Unit 1, Rear of 7 Wellington Road, Sandhurst, Surrey GU17 8AW. Tel: (0252) 877431.

● GAMEPLAY

Roger Rabbit is split into three separate sequential sub-games based on scenes from the film. You control jolly Roger, who's just been framed for the murder of Marvin The Gag King, in a frantic search for Marvin's will before Judge Doom 'dips' (dissolves) Toontown and all its Toon characters.

The first section places you in the driving seat of Benny The Cab, racing across Toontown in a weird cartoon automobile complete with 'springy' accordion-like suspension which can rise to the occasion when you need to avoid other traffic. You also have to avoid 'dip' on the road (if you don't, you'll lose a life), and if you do bump into another car you'll lose valuable time in your race against Doom.

The middle section puts you inside The Ink and Paint Club, running around tables searching for the Will, which is somewhere amongst all the napkins, receipts and bills. You have to collect all of them, and there's no time to lose.

Of course it's not that simple, as you have to avoid not only the gorilla bouncer (who takes great joy in enforcing the house rule: No Rabbits), but also alcoholic beverages (Roger can't take his drink).

Another dash through Toontown will get you to The Gag Factory in the last section, where you have to use a load of fast and furious gags in order to make the security guard weasels laugh themselves to death. Once that's over, it's the final confrontation with Doom himself, with the fate of Toontown resting on your humble shoulders!

GREAT GRAPHICS!
(Shame about the gameplay!)

● GRAPHICS AND SOUND

'Outstanding' doesn't even begin to convey the brilliance of the audio-visuals – they're almost faultless in their execution. Definition, animation and colouring of the sprites are splendid, and are backed up by great backdrops and excellent in-between screens.

Of particular note are the stunning sprite animations in the restaurant section. You could almost believe you're watching the film itself.

Audio is split between several jazzy soundtracks and simple spot-effects, and really conjures up the atmosphere of 1940's Toontown.

● OTHER VERSIONS

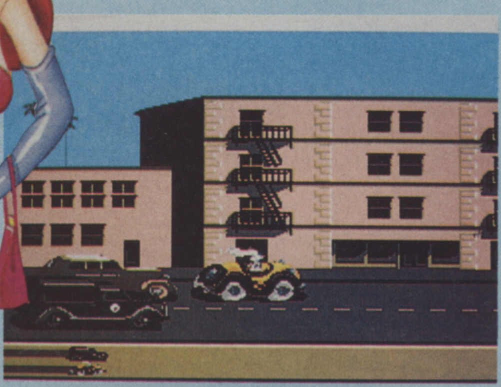
There are no details on the availability of *Roger Rabbit* on other formats – but the superb audio-visual quality of the Amiga version is a tough act to follow.

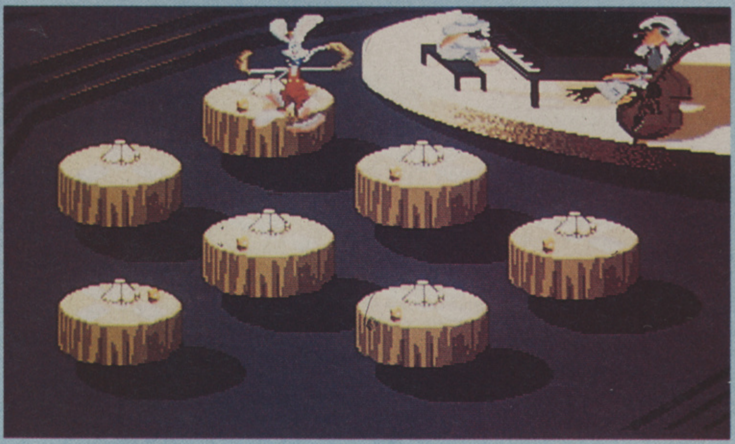
● EXPRESS VERDICT

Roger Rabbit contains some of the best visuals on any game we've seen on the Amiga; it's unfortunate that this standard is not matched in the gameplay stakes – what gameplay it does contain is boring, repetitive and unrewarding. Worst of all, you're left with a feeling of incredible frustration and annoyance as you swap the game's two disks eight times – on a single-drive Amiga – before you actually start play. And you can't restart the game without reloading it all again.

As a demo *Roger Rabbit* easily attains a five-star rating. As a game, it fails.

✪ **Rik Haynes**





• Lovely visuals – pity about all the disk-swapping.

GI HERO

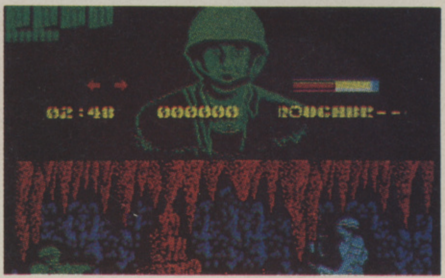
FIREBIRD

Spectrum • £7.95cs
Also on CPC
Out soon on C64

***GI Hero* places you in the role of one of America's blue-eyed boys assigned to shot the hell out of the enemy (no doubt commies) and save the day.**

● GAMEPLAY

You take the role of a soldier in a mission to recapture vital NATO peace documents from the clutches of the mysterious enemy. In play you control a lifelike sprite character which can move, shoot a gun and – via some pull-down menus – perform other tasks such as reloading, using a torch and setting explosives.



• A real dog of a release...

On your travels you encounter hostile forces and places to explore – but you've got to be quick 'cause you've only got 24 hours to complete your mission.

● GRAPHICS AND SOUND

Audio-visuals would have needed to be really good to make this release stand-up – it's a pity they turned out to be rubbish.

The sprites have only a limited amount of animation frames and are completely surrounded by a horrible silhouette which makes them look both clumsy and ineffective. On top of that, only half the display is used for the on-screen action – despite the game using a flip-screen approach rather than a horizontal scroll.

Audio is equally appalling, with unimaginative and limp soundtrack and sound-effects.

● OTHER VERSIONS

The CPC version is just a straight translation from the Spectrum. No details on the C64 version yet.

● EXPRESS VERDICT

GI Hero probably started life as a brilliant concept – but somewhere along the line it turned into another sub-standard type of release. Not even the obviously tacked-on pull down menu option or the relatively large play area redeem this repetitive, boring and utterly forgettable release.

Go for the recent batch of *Ikari Warrior* type games, they offer a far superior slice of soldiering.

✪ **Rik Haynes**

Thunderblade

Operation Wolf

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HELP!

Machine code mastery

Please could you tell me if it is possible to program in machine code on the C64 without an assembler or any other utility. I understand a bit about machine code and I would be grateful if you can help.

W Cooper, Fair Oak, Hants

Ash...a masochist of the old school! Yes, it's perfectly possible to program any computer in machine code without an assembler (a process known as hand-coding) – it's just unbelievably tedious.

Once upon a time there was no alternative, which is why so much effort has gone into developing computer languages over the last 30 years or so.

However, if you're sure you want to do this...

All machine code instructions equate to a single-byte number, with additional one or two-byte operands or chunks of data. So all you need to proceed is a list of the 6502 instruction set which gives you the byte-values in the various addressing modes.

For example, the LDA instruction in absolute mode gives the hex value AD, and therefore the machine code command

LDA £255

equates to two bytes.

AD FF

Equip yourself with pen and paper, write your assembly language program, then go through the program instructions line by line, translating the opcodes and data into their byte values. Watch your step when you're calculating branches, and don't forget the 6502's need to have two-byte numbers written in low-byte, high-byte format.

That part's a grind. Now comes the boring bit. Write a Basic loader program that converts your hex values into decimal, then POKEs them into memory. All your byte values have to be typed into DATA statements. That's all there is to it.

But you really should think about buying an assembler. They don't cost much and life is really too short for the alternative.

HELP!

PC posers

I just got rid of the old Spectrum 128 and blew all my hard-earned savings on an Amstrad 1640 PC. I would be grateful if you could answer a few questions.

1. Another hobby of mine is shortwave radio. I had some software on the Spectrum for downloading satellite signals – is there any similar software for the PC? If so, where from and how much?

2. I am a member of Micronet 800 and am currently lost without modem. Which would you recommend and what software?

3. How do you make a profit at 48p???

James Ollfora, Montrose, Tayside

1. Good news: there's a lot of amateur radio software for the PC, a good deal of it in the public domain – i.e. it's free. Try Shareware Marketing at **87 High Street, Tonbridge, Kent**; tel 0732 771344. There are a couple of user groups you might try too. Write to Trevor Tugwell, **6 Kestrel Drive, Mudeford, Christchurch, Dorset DH23 4DE**; and Peter Nicol, **38 Mitten Avenue, Rubery, Rednal, Birmingham B45 0JB**.

• Amateur radio on the PC 1640? See *PC posers*

2. If Micronet is your main concern, it's hard to beat Amstrad's own combination of internal V21/V23 modem and software which is widely available for under £100. If your comms ambitions are somewhat greater, Amstrad's new MC2400 card modem supports all popular protocols including 2400 baud V22bis. Priced around £180, it also included the *Mirror 2* software package.

3. Let's not overlook the possibility of talent, dedication, remarkable business acumen and sheer genius.

HELP!

Video link

Can you suggest the best method for transferring graphics from the 520ST to video? I have tried using the video lead from the computer to the video recorder but the loss in colour and sharpness is not acceptable. Do I need an image enhancer or similar equipment to obtain an improved result?

J. Armstrong, Milton Keynes

What you need, Mr Armstrong, is a video sub-system called a genlock, a device that lets you manipulate video images between your ST and video recorder (or any video source, come to that).

At one time there were a lot of companies promising these devices for the ST but there seems to have been a major reversal in the trend. I had precious little success in tracking down ST genlock systems.

The single source I found is SCC Mail order, at **29 Crowtree Road, Sunderland SR1 3JU**; tel 091-565 5756. It is advertising a genlock built by Rendale; unfortunately, I haven't been able to find Rendale itself, and SCC was unavailable when I tried to contact it. However, you may have more success.

If any readers do know of other genlock suppliers, perhaps they'd like to share the information. Write to Tech Tips at the usual address.

TIP

Daisywheel dream

An Amiga-owning reader asked about the prospects of connecting an old Commodore MPS daisywheel printer to his new machine. Unfortunately, I have misplaced the letter.

However, there might be some good news for Mr X. It depends on whether the printer used the Commodore serial or parallel interfaces.

Most equipment for the Vic and C64 ranges were serial devices, including printers and disk drives, and you could/can chain several such devices together. Older equipment for the Pet used the now-redundant IEEE parallel interface.

If your printer used the parallel interface, Mr X, you're out of luck. Nobody supports that any more. However, if it is a serial model you should be able to connect it to your Amiga via a cable from Trilogic. In fact anyone owning a Commodore serial printer can put it to work with their new computer – provided they still have their old C64.

The cable simply makes the physical connections, but it relies on having the C64 as a controller/print buffer. If your C64 has been disposed of, there's not a lot you can do except try and sell the printer and buy a new one.

Trilogic is at Unit 1, 253, New Works Road, Bradford BD12 0QP; 0274-691115.

TIP

Free film!

Here is a money-saving printer tip. I have found that carbon film tapes give a better quality print, but don't last as long as fabric tapes and of course are more expensive.

The major difference in my experience is that the fabric tape is formed into a Mobius loop so that topographically speaking the tape has only one side and one edge. Therefore, for a given length of tape 'Mobiused' it is effectively twice as long. If you take a peek at a well-used fabric tape you will see two lines of wear which illustrates this. Now it would seem that carbon film tapes are not suited to this arrangement and you will see only one line of wear and the carbon on only one side of the tape. Now when the printing density gets too thin, only one edge – one half, that is – has been used. The unused half would normally get thrown away. If it could be used – viola, you have halved the cost of your tapes.

Well, with a little dexterity, patience and about 15 minutes of your time, you can do it.

With the tape cassette on a flat surface, the tape facing away from you, ease open the casing, commencing at the right hand side. The fixing is a series of prongs and holes, and easily comes apart with gentle easing. As soon as you have a view of the way the tape is threaded on the right, memorise this for when

HELP! Driving ambition

I own an Atari 520ST and have just upgraded the disk drive to 1Mb. Could you tell me where I can purchase a lead so that I can run the old drive as an external unit? Failing that, what plugs and sockets do I need to make the lead myself, and do I need a separate power supply?

R. Leah, Mytholmroyd, W Yorks

How can a standard 5.25" disk drive be connected and made to work properly with the ST?

(no name and address as I bought the ST for the kids at Christmas)

A Big Kid.

What was it with ST owners and their disk drives? As if computing wasn't difficult enough to without this sort of malarkey.

First, Mr Kid: the problem of connecting 5.25" disks is fairly easily solved. Try Cumana, a company which not only sells its own make of 5.25" drive, but will also supply the necessary cables to connect them to the ST. It is at **Pines Trading Estate, Broad Street, Guildford, Surrey GU3 3BH**. Tel: 0483 503121.

Mr Leah's problem is more difficult. In your case I'd throw myself on the mercy of the companies that sell drive upgrades since they must have access to supplies of the necessary cables and cases. You'll almost certainly need a separate power supply which introduces extra complications.

Try Cumana, or Datel at **Fenton Industrial Estate, Govan Road, Fenton, Stoke-on-Trent**. Their technical helpline is 0782 744324. Another possibility is Power Computing/Triangle at **44a/b Stanley Street, Bedford MK41 7RW**; tel: 0234 273000, which also makes a range of add-on drives for the ST.

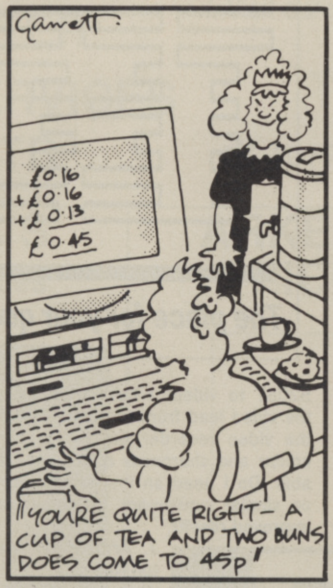
Finally, a useful source for all dabblers in ST hardware is The Miniature Tool Company which stocks a range of cables, connectors and tools. It is at **Unit 10, Bowman Trading Estate, Westmorland Road, London NW9 9RN**; tel: 01-204-6690.

you come to reassemble later. When you get to the left hand side where the winder is, hold this steady relative to the casing. This will prevent it slipping out of place, and save you the job of working out where all the bits came from. Now with a steady hand, complete the removal of the top casing. Should the tape at any time pop out like a demented snake, don't panic – it has to come out anyway. Well, if you haven't already, take out the tape. Ease it from between the winder sprockets by easing back the sprung socket, the one nearer you, with your thumb whilst holding steady the now unsecured winder knob/sprocket.

Now for the putting together again. A second pair of hands can be most helpful, but it can be managed single-handed. That's the patience bit. Still steadying the winder assembly, take a length of the tape and turn this through 180 degrees longitudinally. The carbon printing surface should still be facing outwards as required, but the worn half has now changed places with the unworn half. That is, the worn half is now at the bottom relative to the casing.

Start on the right, and slip the tape into position, holding back the tensioning spring whilst this is done with some suitable probe. You will have memorised how the tape fits in at this end, won't you? Now move your attention to the left hand end and, by again easing back the sprung sprocket, ensure that the tape sits comfortably in position all the way back to the re-entry slot. This done, and still keeping the winder from popping out of position, replace the lid starting from the left. Check all has clicked home, then simply wind up the tape using the winder provided. It takes a lot less time to do than to describe and you will save yourself anything up to a fiver on tape.

John Brand, Banstead, Surrey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HELP!

Oids Aid

I have just bought Oids from FTL/Mirrorsoft and have spent the last two days tearing my hair out. There's just too much going on in the game. I can't get anywhere. PLEASE, give me some playing tips.
David Johnstone, Birmingham.

The first thing to do in *Oids* is redefine the keys to a combination. that's convenient for you. The next is to practise on Novoids, which is by far the easiest of the galaxies. It does take a couple of hours play to get used to handling six different key controls. In particular you should beware pressing the shield recharger at the same time as activating the shield – it wipes out your fuel at terrifying rate. Indeed, successful shield recharging is one of the major skills to getting a high score. Pick a lull in the action, hit the recharger key with a single tap, and then if possible avoid activating the shield until it's fully recharged.

Other tips:

- Make use of the ability to fire through the teleports. You can sometimes destroy most of the enemies in a cavern without any risk to yourself.
- When using a teleport for the first time, activate your shield just before entry – this may save you destructing on a wall the other side.
- A key tip is to avoid picking up men until you're sure you can transport them back safely. Loss of men not only costs points, you also lose out on extra ships.
- Don't limit yourself to nova bombs when attacking enemy bases – continuous firing weakens them.
- Nova bombs are sometimes effective *through* a thin layer of rock. Very handy for disposing of awkward repulsars and attractors – indeed this technique is essential for some planets such as Cyclotron on Gravdromeda.
- Use the editor's ability to load in planets to practice difficult sections.

TIP

Mac disk ejection

If you want to eject a floppy-disk while in an application you just simultaneously press the following keys:

Apple – Shift – 1

But be careful not to update that floppy disk on another Mac though, because, depending on the application you're running, you're sometimes asked to re-insert that disk and the computer may not recognise it if it's been altered.

PS Why don't you review business and games software for the Mac? There are just a few Mac users around you know!

Mr S Cunningham, Sheffield

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Getting into print

Do you want your computer to do something really useful for a change? Then maybe you need a printer. Peter Worlock sets out the ground rules.

Perhaps the single most useful addition you can make to your computer is a printer. Without one, the computer is a self-contained unit – you can get information in, but you can't really get anything out unless you laboriously copy everything from the screen with pen and paper.

With a printer you can create letters and other written documents, you can save drawings and other graphic images in permanent form, and you'll find that most of the things you do with a computer – from programming to playing certain games – will get easier and more enjoyable thanks to the advantages that a printer brings.

That's the good side. The bad side is that there is a greater choice of printers than computers, and they use different technologies that need to be understood before you can choose the right model for your needs. Printers are also complex machines in their own right and getting your printer and computer to work together can sometimes be difficult, bordering on impossible.

It all adds up to confusion.

Unravelling this tangle of threads begins with understanding the different kinds of printer available.

• "You laboriously copy everything with pen and paper'

Daisywheel

Once the premier printing technology, daisywheels have now fallen so far out of fashion they're almost an endangered species.

The technology is very simple, close to that used in most electric typewriters. In one version, the various alphanumeric characters are arranged at the end of stalks which sprout from a central hub, rather like a bicycle wheel without a rim, or the petals on a flower – hence the name.

In a less common version, the characters are arranged around the surface of a ball.

The daisywheel is spun around the hub so that the spoke holding the appropriate character is held over the print position. A hammer then smashes that particular spoke against an inked ribbon and onto the paper, forming the printed image. The next character is then spun into position and the process is repeated. And so on.

The quality of print is very high – exactly as good as that from an electric typewriter. But against that benefit, daisywheels are slow and incredibly noisy – all that mechanical spinning and hammering sounds like a hot time in a war zone.

There are other drawbacks. Each print wheel holds only one character set, or font. So if you want to use italic characters, or a different size of type, or a different typeface altogether, you have to stop the printing process, physically change the print wheel, and then resume. And you have to do this for every change in a document.

Secondly, because the characters are preformed, those characters are all that can be printed. So, no graphics other than very crude, blocky images made up of standard alphanumeric characters.

Dot-matrix

The phrase 'dot-matrix' is usually used to refer to one particular kind of printer, although that kind is more accurately known as an 'impact dot-matrix' machine. The reason for the pedantry is that every printer that isn't a daisywheel is a dot-matrix model – even ink-jet and laser printers.

The name dot-matrix comes from the way in which images are built up on the paper – as a series of dots. This is a very useful method for a computer user because it is exactly the way the computers store their own images of characters, graphics, and anything that can be displayed on-screen.

Impact dot-matrix machines create their printed image by firing a series of pins or needles against an inked ribbon which is hammered against the paper.

Early printers of this type used a vertical row of seven or eight pins, but most modern machines use a minimum of nine. Each character can then be described as a grid of dots up to nine deep and of varying width. As the print-head travels horizontally across the paper, the characters are created a vertical row at a time as the appropriate pins are fired.

That is the basic description, but impact dot-matrix printers are much more flexible than that. For example, a row of nine pins isn't really sufficient to build up a 'clean', high-quality character image. So manufacturers added facilities whereby the print position could be varied by a few hundredths of an inch and each set of dots could be overprinted.

Using this system of overlapping dots, a much higher quality print image could be created, but obviously at the expense of speed of printing, since each character now takes a lot longer to print.

Secondly, manufacturers increased the number of pins in the print-head. A few models have been produced using 18 pins, but most manufacturers have skipped the intermediate stages and gone straight to 24-pin print-heads. This has the twin advantages of providing higher print quality and faster printing.

It is also clear that, since the printer creates an image in exactly the way the computer does, a dot-matrix printer is capable of printing any image your computer can display, usually to a much higher standard. At the least this means that, unlike a daisywheel, matrix printers are excellent at printing graphics.

The drawbacks are not so clear cut. The main one is a loss of print quality compared to daisy-wheel machines although a good dot matrix can be adequate for most letter writing. Although not as noisy as daisywheels, matrix printers are still quite loud. And different models create different sounds, anything from a swarm of angry bees to something horribly similar to a Stuka dive bomber.

Similarly, matrix printers are much faster than daisywheel printers, but not as fast as the newer page printers.

Thermal

The single biggest drawback of any kind of impact printer is noise. Thermal printers get around this problem by using no mechanical parts in the print-head so there's no hammering or banging.

Instead, these machines use a special paper coated with heat-sensitive chemicals. The print-head may use a variety of heat-generating sys- ☞

tems – the simplest is just an electrical spark – but the effect is the same: to build up a character as a series of dots by heating – and therefore blackening – small areas on the paper.

Thermal printers therefore have the advantage of being virtually silent in operation. However, that is their only advantage. Against that, they are slow and rarely offer very high quality print. And there is the expense and difficulty of obtaining suitable paper.

Ink-jet

A better solution to the problem of noise is the ink-jet printer.

In the simplest configuration you have a reservoir of ink and a single nozzle. As the print-head passes over the paper the printer spits a particle of ink onto the paper. For speed, multiple nozzles can be used, building up an image dot by dot in the normal dot matrix manner.

Ink-jet printers are nearly silent, and can be very fast. Print quality, too, can be good but choice of paper can have a great effect – too absorbent and the image blurs, too shiny and non-absorbent and the ink smears.

Page printers

The newest print technology and by far the best. Naturally, page printers are also the most expensive.

The title of page printer covers a variety of technologies but they are all basically similar and result in identical print quality and speed of output.

In all types of page printer the image is held in intermediate form on an electrostatically charged drum. A sheet of paper is passed against the drum and picks up the charge which then attracts tiny particles of toner powder to the areas which are to print black. Finally, the paper is heated to bond the toner to the page.

The difference in technology arises from the way in which the image is created on the drum. In the most common type a laser beam is used to generate the charge – these are naturally known as "laser printers"; in others an array of light-emitting diodes is used; a third kind employs an array of liquid-crystal shutters.

The end result is a very high quality print for both text and graphics, and speeds of up to 10 or 16 pages per minute (by contrast, dot-matrix printers normally output about one page per minute). Page printers are also very quiet in operation.

The only drawback is cost. Prices start at around £800, and the best can cost ten times that or more.

How to choose

When trying to choose which kind of printer to buy, a useful rule of thumb is that you can have – at most – three of the following desirable features:

1) High-quality text
2) High-quality graphics
3) Quiet operation
4) Fast operation
5) Low cost

The exception is the page printer, which provides all of the first four, but certainly not the fifth.

High-quality text in this instance means letter-quality, and only page printers and daisywheels provide that. Although 24-pin matrix and the better ink-jet printers give you 'near letter-quality', the difference is still noticeable.

So with a daisywheel you get features 1 and 4. With an ink-jet you get features 2 and 3, and possible 4. If noise levels are important then ink-jet or page printer should be your preferred model.

From this, you can begin to understand why impact dot-matrix models are far and away the best-selling computer printers. They are an almost perfect compromise: text and graphics quality may not be the best, but they are very good; on specially-designed models speeds can approach those of the slower page printers; and the prices range from as little as £100 to well over £1,000.●

Next week:
Computer + Printer = Chaos

Technobabble
A weekly assault on computer jargon

Printer Jargon

NLQ Near Letter Quality, which means 'almost as good as a typewriter'. But beware, some manufacturers have a pretty loose understanding of 'almost'.

CPS Characters Per Second, the standard way of measuring printer speed. Manufacturers always quote speeds under ideal conditions – real speeds may be 10 to 25 per cent slower. 100 CPS translates to roughly one page per minute.

PPM Pages Per Minute, the standard way of measuring print speed from page printers. Again, quoted speeds are ideals and few printers will match them in real use. All quoted print speeds refer to pages of plain text. Graphics will always take much longer to print, on any kind of printer.

DPI Dots Per Inch, the standard way of measuring printer resolution and, hence, the quality of print. Most impact matrix printers output at anything from around 70 to 160 dpi. 24-pin printers have a theoretical resolution of as much as 360 dpi, although true resolution will be somewhat less than that. Page printers typically handle 300 dpi. Professional 'typeset quality' is reckoned to start at around 1,000 dpi.

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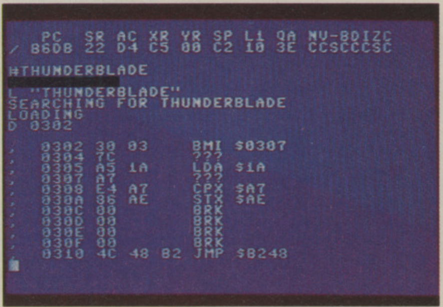
GAMEBUSTERS

Rik Haynes goes underground to witness the shady world of a games cracker

Games crackers are the subversive, much-resented people who break into games and pass copies around their shady networks. But how do they do it? And what's the motive?

***Express* made contact with one such cracker at a secret rendezvous. No names, no identification, was the agreement. We watched him at work, breaking down US Gold's *Thunderblade* – possibly this Christmas's biggest selling game. In a matter of minutes, with widely available, cheap equipment, he'd done it. No peculiar crackers' aids were needed.**

We've edited out all the specifics and tricks of the trade which could allow someone to get into cracking from scratch. What is left is an insight into the mysterious Mr X and his cynical games-cracking techniques...



```
   PC  SR AC XR YR SP L1 QA NV-BDIZC
/ B6DB 22 D4 C5 00 C2 10 3E CCSCCCSC

#THUNDERBLADE
[redacted]
L "THUNDERBLADE"
SEARCHING FOR THUNDERBLADE
LOADING
D 0302

,  0302 30 03      BMI $0307
,  0304 7C         ???
,  0305 A5 1A      LDA $1A
,  0307 A7         ???
,  0308 E4 A7      CPX $A7
,  030A 86 AE      STX $AE
,  030C 00         BRK
,  030D 00         BRK
,  030E 00         BRK
,  030F 00         BRK
,  0310 4C 48 B2   JMP $B248
```

• Disassembly of Thunderblade's Loader. We've blanked out some of the more sensitive data...

Cracking the cracker

Would you call yourself a hacker, cracker or pirate?

A hacker is more of a person who uses a modem to break into large computer networks. A pirate is someone who can't crack or program and just copies software and then sells it. They should be done for it.

I'm a cracker – a person who rips out games program protection and swaps software with fellow crackers for no financial gain.

Have you ever done any hacking?

No, I wouldn't know how to.

Would you be interested in it if you could do it?

Only if I could fiddle loadsamoney out of it [*laughs*].

How long have you been cracking software?

Only since November '87.

What did you do before that?

I was younger, I just copied games from friends. Then I got more interested in programming and trying to actually improve them, especially some

Cracking the game

Surprisingly, Mr X's system consisted of a normal set-up: C128 computer, disk drive and TV. Mr X informed me that all he needed to break into a game was a commercially available cartridge which costs around £30. He also told me that for his own convenience he'd fitted a different DOS into the disk drive – to speed up disk operations. There were no weird and wonderful gadgets or widgets necessary.

08:40:03 PM
Mr X starts to crack *Thunderblade* by US Gold on C64 disk.

08:40:26 PM
Mr X loads up the directory to see if it's protected. He finds only one file on the disk called "THUNDERBLADE" which is the Loader (the program which loads in the rest of the game).

"(*Expletive deleted*)! It's a protected file with only one filename visible."

08:40:57 PM
Mr X types in a command which tells him where the Loader resides in memory when it's loaded.

08:41:04 PM
Mr X then loads the Loader and searches for any references to other filenames in the program.

"The trick is to find the next file that the Loader loads in. Once you've found that you're on your way."

08:41:29 PM
Mr X loads a disk utility which allows you to view and edit individual tracks and sectors on the disk.

Mr X scans the directory track which stores the disk's file information in an attempt to find any "hidden" filenames.

"No luck."

08:42:13 PM
Mr X actually loads in *Thunderblade*, then resets back into the monitor to find out where in memory the program has loaded into.

Mr X immediately finds the start address of the program and then starts disassembling the program at a hectic pace.

"I'm searching for the start-up sequence."

A start-up sequence is where a program initialises itself: resetting the graphics and sound registers, readdressing the interrupt routines, displaying the title page and starting the soundtrack, etc.

"A start-up sequence isn't anything specific. It's just that most programmers follow a similar pattern such as changing the screen colours – stuff like that."

08:45:23 PM
During this process Mr X believes he's found more of the Loader program so he saves this block of memory to a blank disk.

Mr X then saves the rest of the program to that same disk.

"If if wanted I could write my own Loader allowing me to play the cracked copy of *Thunderblade*, but you'd only get the first level because *Thunderblade* is a multi-load game."

08:47:40 PM
Mr X starts to read *Thunderblade*'s instructions to find out how many multi-load levels are in the game.

"Looks like four levels, (*expletive deleted*)!"

Mr X then plays the game to find out how many lives the player gets per game.

"Not a bad game, is it?"

08:48:36 PM
Mr X disassembles the Loader program again.

"Why didn't you give me a single file game to crack? It's gonna take me a long while."

08:49:40 PM
Mr X uses an ASCII memory search for the word "STAGE". If he finds it he could look for an instruction that updates that area of memory which will help him pinpoint the next level part of the Loader.

"It's worth trying anything, but obviously this hasn't worked."

08:51:07 PM
Mr X searches for the ASCII word "LIVES" in a similar hope to the last attempt – only this time the idea is to do with giving himself infinite lives.

"It'll make my job a lot easier when playing the game to get to the next level Loader."

08:52:46 PM
Mr X takes another look at the Loader, still trying to find the filenames held somewhere within.

Mr X has another swig of Coke.

"I hope I can get this wrapped up before 12, I've got other games to crack."

08:54:47 PM
Mr X hunts through memory looking for a machine code opcode in a effort to find the initialisation routine which handles the player's lives.

The monitor informs Mr X of addresses which contain the opcode.

"Trouble is, I don't know which one's the lives and it could be one a number of assembler instructions checking to see if the lives count equals one, instead of the usual zero."

08:56:26 PM
Mr X searches through memory.

"Multi-load games are bastards. I'll have to crack each part separately once I've ripped out the Loader."

08:58:05 PM
"I really do think this is gonna be hard. Wouldn't you like *Better Dead Than Alien* instead? It's brand new. It was only released in the shops today and it's a single load [*laughs*]."

09:01:47 PM
Mr X receives a phone call from a fellow cracker who talks about what games he's cracked today including *Arkanoid II* on the Amiga.

09:05:40 PM
Mr X finishes his phone call.

"*Thunderblade*'s already been cracked by another crew. I think this is a waste of time."

09:08:30 PM
Mr X receives another phone call from a different cracker – a person who seems foreign because they both have difficulty understanding one another.

"Okay I'll see you at the copy-party in Holland."

09:11:01 PM
Mr X sees that I'm writing his phone call replies into my note pad.

"I don't like the idea of you writing every (*expletive deleted*) thing down. That's a personal phone call you bastard.

"I'm not doing this any more."

Pause.

What do you want to do?

"I want to leave it now. Your editor won't see these notes will he? Keep out those bits about the phone calls."

Why?

"They're not really necessary to the article."

Why do you think that?

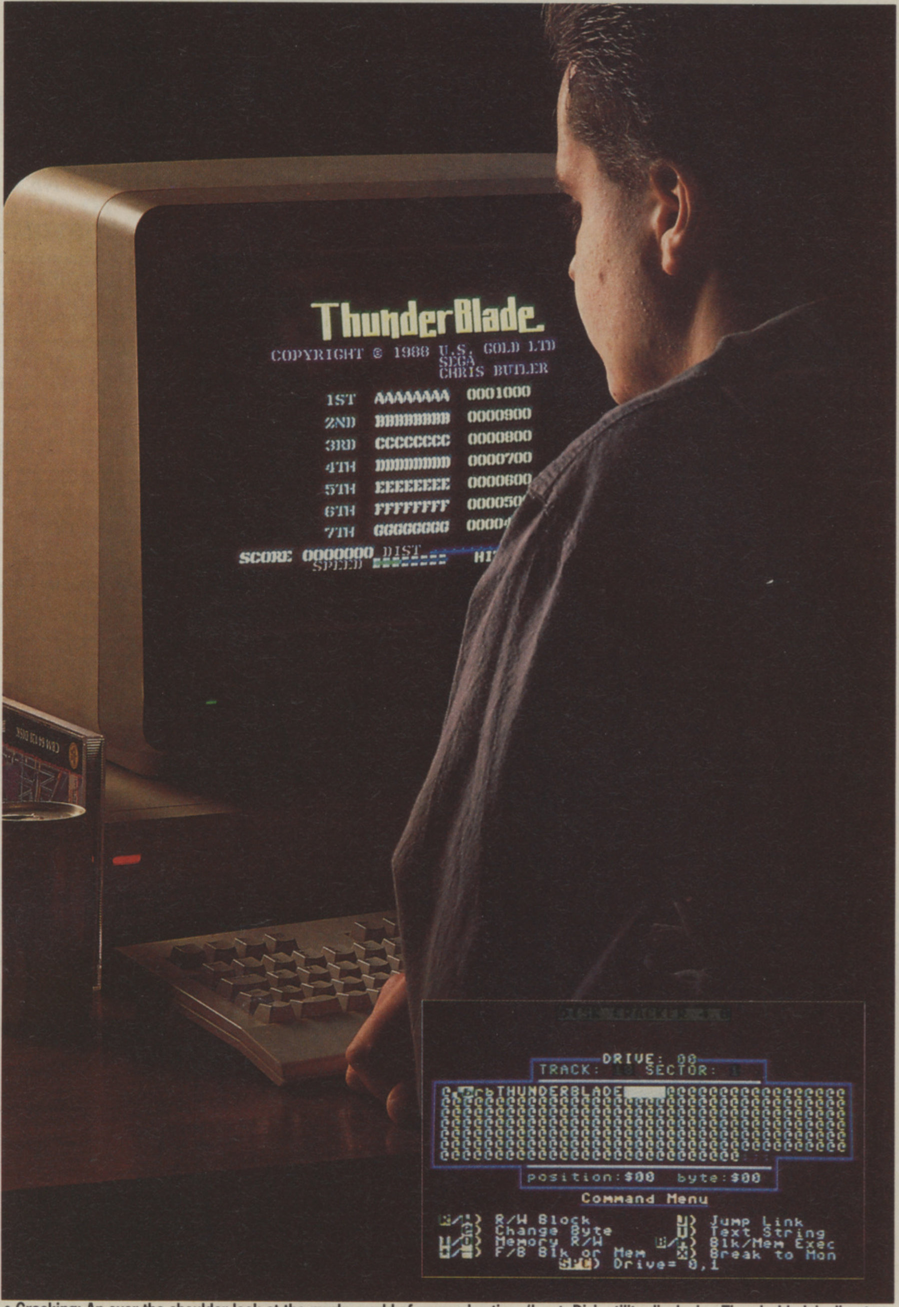
"A phone call's a phone call, innit! They're personal."

But you were talking to fellow crackers, weren't you?

"No I wasn't. End of subject."

Do you mind if we talk about cracking in general?

"Yes, okay."



• Cracking: An over-the-shoulder look at the murky world of games busting. (Inset: Disk utility displaying Thunderblade's directory track. Exact track and sector numbers deleted for obvious reasons.)

of the games that come out today.

What improvements?

Some games that come out are completely bug-ridden like that *Gary Lineker* game from Gremlin – a cracking crew fixed the bugs in that game. I also improve loading routines making them load faster, shorten the length of the program allowing more games to be placed on a single disk, and put extra features into a game like infinite lives and the ability to start at any level of the game.

Do you think you're better than the professional programmers?

No, because they can write games. I can't. I purely de-protect their stuff for my own use.

How many titles do you crack in a week on average?

Everything that comes into the shops. Anything that's new.

How do you get the original titles?

[*Long pause*]

From friends that buy them.

Why should your friends give them to you if they've spent money buying them?

'Cause they get better versions of the game back in exchange, especially with games that are hard to play.

How many cracked games have you got in your collection?

I crack them, and then scratch them a week later. They have to be good to keep. I've only got about 300 disks with about 8-10 games on each disk. I've got more demos than games.

What are demos?

Demos are examples of programmers' work. They normally consist of ripped-out graphics and music from games, but they can also be 100 per cent original. They include messages to other programmers and crackers. We swap demos by mail and by Compunet.

Does Compunet have any direct connection with cracking?

There's no link between Compunet and software piracy. It's just a forum for programmers.

How many other crackers do you know?

Loads – about 15-20 crackers, plus other people who just copy software.

Where do the other crackers come from?

All over the world: America, Holland, Denmark – but mostly the UK and Germany.

How old are they?

They range from 15-30, but most of them are either schoolkids or students.

How do you swap software with the other crackers?

[*Long pause*]

By mail I suppose.

There was a pause before you answered my last question. Is there another way?

No, I just wanted to get around saying it.

Do you meet your fellow crackers at computer shows?

No [*laughs*]. I go there to buy the occasional blank disk, that's all [*laughs*]. I've got to protect the innocent [*laughs*].

If you didn't crack games would you buy them?

No.

Why not?

Too expensive.

Is that the main factor prompting you to crack?

I'm not interested in buying software. I crack games for fun. I don't make any money out of it. If you really like the game you'll buy the original, just like a video or music tape.

Do you also copy music and video tapes?

A few music tapes, sure. 99 per cent of the people with videos have. I bet you have too, you bastard [*laughs*]!

Have you ever bought an original?

Yeah, I used to buy originals when I first started out. But then I thought, sod this for a laugh – especially when most of it is crap.

What do you feel about the people who buy original software?

It's alright for them if they can afford it. They must be satisfied, otherwise they wouldn't buy originals, would they? When I get a game we only play it for five minutes. There is no way we hurt the industry. Just look at all the software shops making money.

Do you only crack on the C64?

Yeah, but I've got plans to crack on the Amiga in a couple of years time – I already copy software on it. Then again, I might be out of it by then. I don't want to crack for the rest of my life do I?

What do you think you'd do instead?

Out in the streets causing havoc, causing a bit of damage. Going out drinking, kick in a few coppers. The usual Saturday night stuff [*laughs*].

You say you don't like the way magazines publicise you, but you are breaking the copyright laws aren't you?

In a sense, I suppose yeah – but I'm not making a profit out of it. That's what the software companies are interested in. I crack in my own home and for no gain. Standards of games software are getting too low to justify buying them.

Magazines just exploit the whole scene, probably just like your one's going to. They always bring out their little ill-informed bits on piracy, forgetting that most of their writers used to be, and still are pirates themselves. That's how we get previews.

Do you personally get any software from any magazines?

No I don't. I don't get any chance, do I [*Laughs*]?

Is there anything else you want to say?

(*Expletive deleted*) off FAST! No, only joking. FAST are no bother to us, they're just after the big-league commercial pirates. Any court would just chuck it out. They can't do us.

It works in exactly the same way as the music industry – just look at all those twin-tape hi-fis, only made for copying music tapes or software on cassette. It's just hypocrisy. Video is slightly different I suppose, I don't really know.

If this article is too sensational you may get done over. Only joking mate [*fits of laughter*].

Crackers?

Are these crackers crazy people who will damage the software industry? Will that then mean that there is less money available to produce innovative software? Or is software fair game? Are these crackers just tweakers in their own twilight world who can't really damage anyone?

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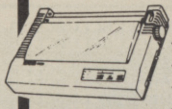

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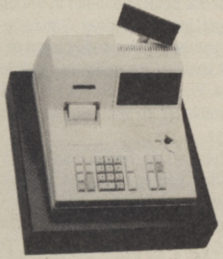

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ST

...show business

My second, and final, installment looking at the various product announced or released at the recent Atari Show. Yes, so much new ST product was broadcast that there wasn't enough room to mention it all in last week's column.

More bits

Still reeling from the shock of Microdeal's Replay 4 sound sampler? Well, don't stop. By all accounts Replay Deluxe isn't far off. Read on.

Features include 10-bit analogue to digital sampling, 12-bit digital to analogue playback, 5KHz to 48KHz frequency rates, and four hardware anti-aliasing (method of removing clicks and other interference; smoothing technique) filters. Remember, CD sound is sampled at 44.1KHz using 16 bits.

The Replay software provides magnify, cut and paste, merge, fade in and fade out, reverse and zoom; real-time fast Fourier transforms, incoming sound wave display and frequency analysis; two and four times over-sampling; reverse, echo, reverb and frequency playback effects.

All this for £150. Microdeal, 0726 68020, will doubtless tell you more.

Mandarin Software – responsible for releasing the game creator *STOS* earlier this year which, incredibly, entered the Gallup ST Top 10 chart after a week – announced a design-a-*STOS*-game competition. The competition is open to professionals and amateurs alike who must develop a program using *STOS*; the prize is £5,000. Entries will be accepted until 10 days before the Spring 1989 Atari show. More from Mandarin on 0625 878888.

Autoroute from Next Base (0784 60077) looks like being a hit with executives visiting clients, families planning trips, bosses checking travelling expense accounts aren't being exaggerated, and journalists looking for short-cuts so they can make even more out of expense claims. *Autoroute*, if you haven't guessed by now, plans the quickest, shortest, cheapest or most comfortable car route possible from one point to another in Britain. Directions and maps (digitised Ordanace Survey affairs) can be printed or displayed on screen. Various levels of magnification and detail are possible. Price is £149.50. All you need now is the portable ST so you can plan journeys on the move.

Glentop, of *GFA BASIC* fame, has a couple of graphic packages in the pipeline. *Ray Trace* will be the first to arrive and – as the title implies – provides you with a method of producing ray-traced stills quickly. The software is known to use a technique whereby more colours than the maximum GEM limit of 16 can be displayed. Eddy Maddix at Glentop reckons the title will be priced around the £50 mark. Details on the second product are sketchy, but it will be a paint package of the same ilk as *Neochrome*, *Degas*, *Art Studio*, *Art Director*, *Flair*, etc etc. Details on 01-441 4130.

MIDI users look out for *MidiGrid* from CDP at 11 Kilburn Rd, York, YO1 4DF. With it, you can customise your MIDI instrument on screen and play the edits using the mouse. *MidiGrid* is totally graphics based and lets you reconfigure all or any of the notes on your keyboard to play a single note or an entire composition. Price is £134.55. Another MIDI offering – this one from AB Software whose product is distributed by Ladbroke (0772 203166) – called *MidiStudio* lets you record compositions using 20 tracks. £99.99 if you want one.

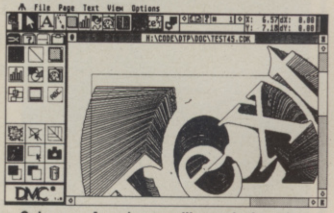
Personal Robots – who design all sorts of interesting contraptions including mobile security robots, robotic lawn mowers and *Robokit* (of most interest to STers) – has revealed that it will release several modules for *Robokit* during 1989. Planned are *Robokit Neural*, *Robokit Animator*, *Robokit Vision* and *Robokit Speech*. As with *Robokit*, Atari will do the marketing and SDL the distributing. So ring Silica on 01-309 1111 if you want to know more.

Finally there was Anco providing more smutty software – *Maria Whittaker's Christmas Box*. Mmmmm, another strip poker game. But this one's different: it's got two difficulty levels. Boy, does Miss Page 3 play a tough game on Easy and an easy game on Tough. Anco's joke? Remind me to laugh next time. I managed to divest her of her Santa hat...what lovely hair she has. Perhaps I wasn't concentrating. Still, there's bound to be an Easter bunny to look forward to.

STateside happenings

Occasionally I shall let you in on what's stirring ST-wise in the States. Americans appear to be keen on using STs (Mega 2s and Mega 4s in particular) for DTP. This is reflected in Atari US's latest software lineup:

Calamus Plus – that's right, even though us Brits haven't seen *Calamus* yet. Apparently, this super DTP package will have built-in presentation and bitmap graphics to rival Adobe's *Mac Illustrator*, vector graphic editing functions, 16-colour painting options, and direct-connect facilities for phototypesetting. A whopping $449.95 price tag has been given to this Mega ST-only product. What will the price be when it reaches our shores? *Calamus* is reported to cost $299.95 in the States, while Atari UK are proposing an inflated £399. As the man in the TV add says, "who's taking who for a ride?"



• Calamus: Americans will get it for almost half the UK price. Do what?!!!

UltraScript – a PostScript emulator for the SLM804 laser printer that should work with all current DTP packages. Apparently Atari plans to bundle the program with the laser printer and up the laser's list price by $200. What a bargain. *UltraScript* comes with 16 scalable fonts and can produce grey-scaled and halftoned images. Font packages, providing all the Apple LaserWriter II fonts originally designed by ITC and Linotype for Adobe, will be available. Others fonts are pencilled in for the future.

DeskSet II – yet another DTP package. This one weighs in at $299.95. ASCII text files from most major word processors can be imported once they've been passed through a translation program. IMG picture files are supported, along with a collection of common paint program files. Scalable outline fonts, auto-flow, WYSIWYG (*Yeah, we've heard that one before – Ed*), linguistic-based hyphenation in eight languages, floating tabs and more promised.

Richard Monteiro

PC UPDATE

Wells go far

Anyone reading the business computer press can't help but have noticed all the brouhaha about PS/2. IBM's new micro architecture has even slipped its fingers under the belt of this columnist and earned itself a few column centimetres. The two main questions are still 'Will it become the new standard for business PCs, and if so, when will we all have to abandon our XTs and ATs in favour of it?' Most manufacturers have hedged their bets by producing two ranges of machine, one using the AT bus, the other with PS/2. One company, though, has had the foresight to hedge itself into a new type of PC.

Wells American, father of the Super Brain, a 64K CP/M machine which at one time was almost a synonym for business computing, has just set up in the UK and released the CompuStar tower. Apart from looking particularly well made and being BIG, there is little on the outside to distinguish this machine from many other floor-standing systems. Inside, though, there's a lot more to look at.

The CompuStar is a completely modular PC. Not only can you swap expansion cards in and out as you need them, you can also swap out the CPU (which can be an 8086, 80286, 80386SX or 80386 proper) and the bus! This means you can have an AT bus machine one minute and a PS/2 machine the next. Or, in the transition period, you can run both buses at the same time. The CompuStar isn't slow either. The 286 variant has been rated independently as one of the fastest 286s around, and the 16MHz 80386 is rated at an impressive 6 mips. Wells will allow you 100 per cent of the cost of any CPU against the cost of an upgraded card.

All this wizardry doesn't go cheap, of course. A typical 286 configuration with 1Mb of RAM and a 40Mb hard disk will be in the region of £2,500 to £2,600. Talk to Chuck Sullivan on 0494 26211 for more details.

Hard disks go fast

There's an undocumented utility supplied with MS-DOS 3.3 which is documented with the newer 4.0 version of the operating system, and can substantially increase the speed of your hard disk. Type FASTOPEN followed by the letter of your hard drive and you will find that disk access is speeded and many operations (like displaying a directory) now happen without disk access at all. Having not been able to lay hands on the manuals for DOS 4.0, I'm still not sure exactly what the command does, though presumably it's some form of caching. Perhaps someone who has seen the documentation can let me know. In the meantime, those with 3.3 can give it a try, and perhaps add it to their AUTOEXEC.BAT files.

Hard cash goes further

One way of equipping your PC with a good range of software in one fell swoop is to buy an integrated package. This is a suite of software providing most of the major applications in one package and theoretically allowing the same data to be used by a word processor, a database or a spreadsheet. Database Software has pioneered this concept in the budget market with its *Mini Office* series on all manner of machines. The latest version, *Mini Office Personal* on the PC, has taken a more 'designer' approach with fancy packaging and brushstroked white floppies.

Behind this yuppie facade lurks a set of five programs which approximate to the aforementioned applications, with the addition of a comms program and a label printer. The programs are best described as utilitarian. They all work and seem to be well integrated (they can all take data from any of the other modules), but the facilities provided by each, as you would expect, fall short of those provided by one-task applications.

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Nonetheless, there are some surprising inclusions in the each module. The word processor has block handling and search and replace, and includes a word count. This is something beloved of journos everywhere who have to write to length, but something specifically excluded from some of the big names like *WordStar*.

The database will sort on up to four fields and has a free form screen editor. The spreadsheet has a usable size of 52 columns by 200 rows and a decent set of formulae, and the comms program includes Prestel and Telecom Gold support, which is good on a PC. The label printer can be adjusted for any size of label and can handle several labels across the web.

All in all, a very respectable package at an amazing price – £29.95. Ring 0625 879920 for further details.

And yes

Last week's example for backing up all your TXT, LET, INV and REP files would actually back up only the TXT files, but do it four times! The wrong listing got into my final copy through what we know in the trade as a cock-up. The four lines in question should, of course, read:

```
COPY C:\WP\*.TXT A:
COPY C:\WP\*.LET A:
COPY C:\WP\*.INV A:
COPY C:\WP\*.REP A:
```

Sorry. It may not happen again.

Feedback

If you find an item in this column of particular interest, have any hints or tips on DOS or related PC matters, or strongly disagree with any of my ramblings, please drop me a line. Write to **PC UPDATE, New Computer Express, 4 Queen Street, Bath BA1 1EJ.** Sorry, but I can only answer letters through this column.

Simon Williams

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AMIGA BLIT

In search of the ultimate demo

What kind of program did most to promote the Amiga? Was it the spreadsheet, database, animation creator or even music package? No, the programs that sold more Amigas than Commodore didn't even cost a single penny. The programs that I am referring to are, as you may have already guessed, demos.

Back in the good old days of the A1000, when everyone gasped at the specification, marvelled at the multi-tasking, sighed at the sound and then went away and bought a PC, the Amiga looked set to end up suffering the same fate as the Apple Lisa.

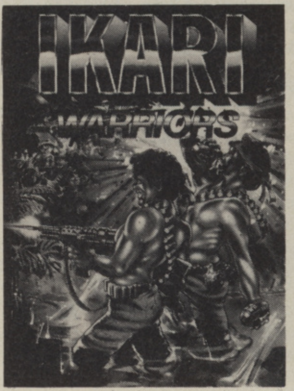
But then a rather elusive little program started circulating among dealers – Eric Graham's now famous *Juggler*. It seems amazing, but the *Juggler* demo probably did more to sell the Amiga than any of Commodore's advertising.

Since *Juggler*, nearly every Amiga programmer seems to have written at least one demo designed to flaunt one or more aspects of the Amiga's hardware. Just look in the public domain libraries – whole disks exist that are filled with demos. In America, competitions are even held annually to find the best demos.

Today's demo writers seem to be of two different types: the hacker and the enthusiast. The hacker writes demos to stick onto the front of a piece of cracked software as a form of advertising. Enthusiasts, on the other hand, write demos for their own enjoyment and for the enjoyment of others, and not as a form of ego boosting.

While I deplore the hackers, it must be said that some of the demos are quite amazing. I've known people collect disks full of demos produced by hackers just because of their entertainment value. If you can acquire these demos then it is well worth the effort. Probably the best demos are written by the infamous Magician 42/Sodan, Dr Mabuse Orgasm Crackings(!) and the Copper Crew.

The best demos from Amiga enthusiasts are to be found in the Public Domain and from other similar sources. Our very own Ian & Mic (they of Sector 64) have written some very impressive demos.


• Elite's Ikari Warriors – see the tip in the "Quickie" box

Lack of Incentive?

Bad new for those of you waiting for an Amiga conversion of the immensely popular *Graphic Adventure Creator* from Incentive. After the release of the ST incarnation, *STAC*, rumours were floating around suggesting that an Amiga version was to follow hot on the heels of the ST conversion, but it seems that all you DIY adventurers are in for a big disappointment.

When I recently phoned Ian Andrews at Incentive to inquire as to when Amiga owners can expect to see the rumoured comversion, Andrews flatly denied that Incentive was working on an Amiga version. He continued, "While the possibility of an Amiga version has not been ruled out, we have no immediate plans to even start work on an Amiga conversion".

It's quite surprising that Incentive has seen fit to ignore the Amiga when it is already producing games for the machine. The market for such a product is currently wide open and I have no doubt the Amiga version would go down a storm. If, like me, you'd like to see an Amiga version of *GAC*, then start writing to Incentive telling them. My letter's already in the post!

Elite: The Ultimate Amiga game?

At last, after years of waiting, THE game has arrived on THE machine: Amiga *Elite* has finally made it. It's been over over five years since *Elite* was originally released on the 32k BBC B, and even today computer users throughout the world are still fighting their way through numerous star systems in search of the ultimate accolade; to be ranked as one of the Elite.

Message Port

If you have any comments about any issues raised within either this column or the Amiga scene in general, why not drop me a line. Equally, if you have any tips that will help others get the most from their Amigas then I'd love to hear from you. Write to: AMIGA BLIT, New Computer Express, 4 Queen Street, Bath BA1 1EJ.

I'd like to take this opportunity to thank those of you that have written in. Special thanks must go to THE NAVIGATOR for sending me a copy of the Dragon's Lair demo. This is a must see for those of you who have 1 Megabyte of larger machines.

With every conversion of *Elite* on the 8-bit systems, the game has been greeted with gasps of wonder and disbelief, and has become an instant chart topper on nearly every machine. So is *Elite* set to do the same to the Amiga games market? I think not.

Before I am formally accused of heresy and burnt at the stake, let's just take a good look at *Elite* and its place within the Amiga games market.

Although *Elite* was heralded as a game ahead of its time when it was originally released, the fact remains that *Elite* is now just over five years old, and while nearly every conversion has improved upon the original, the gameplay itself has remained very much unchanged.

Five years ago, if you wanted to impress a friend, what would you do? Of course – load *Elite*. But now that we've got such games as *StarGlider II* and *Federation of Free Traders*, *Elite* no longer seems that innovative. Before writing into *Express* demanding that I be shot on sight, try playing *StarGlider II* for a few hours and then load *Elite*. I'm sure you'll arrive at the same conclusion. Sorry Firebird, but it's time to move on.

Jason Holborn

Time for a Quickie...

Oh no, I'm running out of space. No worries, there's just enough room for a tip for Elite's excellent arcade conversion Ikari Warriors.

Hidden within the game is a handy little cheat mode. When you manage to qualify for the high score table, enter FREERIDE. Now when you start playing again you'll be complete invinsible!

SPEX

Speccy therapy

Ask any Luddite who's not actually involved in the world of computers to describe a typical micro user and he will talk of an NHS-bespectacled teenager who sits slumped in front of his machine 20 hours at a time, only venturing into the sunlight to stock up on zit cream or the latest tacky strip poker game.

And that just applies to the people who play *games* on their Spectrum! If you use it for anything else, like programming, pools prediction, hacking into NASA or whatever, well, what size straitjacket do you take?!

It's strange how a hobby which requires a fair amount of intelligence (C64 owners excepted), imagination and co-ordination even at its most basic level has such a bad image in the eyes of the non-computer-owning public.

I don't know about you, but I reckon computers are genuinely therapeutic. Return home after a hard day at the office/classroom, and before you vent your frustration on the cat, simply load up *Renegade* or similar. Half an hour later, all your violent tendencies will have vanished. You'll probably be doing quite well in the game, too!

It is particularly embarrassing if you're over the age of 16 and admit to being a home computer owner. Why this is considered childish, when tons of people enjoy running around a forest firing paint pellets at each other or building a scale model of the Eiffel Tower from toenail clippings, heaven only knows!

Whichever way you look at it, using a Spectrum is a much more intellectual pursuit than watching *Neighbours*, and just look how popular that is (*Never heard of it – Ed*)!

Sticky subject

There were more TV antics concerning the Spectrum last week. Those who have better things to do on Monday nights (and if you haven't, you obviously need help) than tune into BBC1's Watchdog will have missed that plug Sinclair User managed to grab.

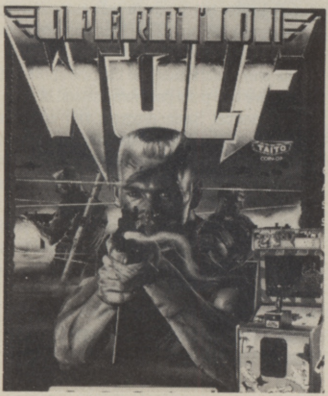
It was hardly good publicity, though. The mag was criticised for printing a small reference to gluesniffing on a competition page. The publisher apologised, but this wasn't enough. Oh no, Watchdog phoned Sir Clive himself! Not surprisingly (!), he denied all knowledge of the publication.

Mr Sinclair might be a pretty good businessman in his own way, but since when has he controlled all the Spectrum-related magazines, software houses, etc?

I'm amazed the offensive line was even spotted. There must be a concerned parent out there somewhere reading computer mags very thoroughly. Who knows, he or she might even be reading this! I doubt anyone's that dedicated, though...

Wolf hit

Now here's a game which doesn't exactly help prove my 'intelligence is needed for computing' theory. *Operation Wolf* is probably not the best thing to show Auntie Eunice when she asks "What do you do with that computer of yours?". It's a 3D shoot-em-up which is best known for the realistic-looking machine gun bolted onto the arcade version.



Obviously, you don't get the rat-a-tat-a-tatting gun with the Spectrum version, but apart from that, and an obvious lack of colour, everything seems to have been crammed in.

The lack of sound and multiload on 48K versions is annoying, but it is still an excellent conversion, at least on the Spectrum – I can't speak for the other versions. If you've saved purchasing it 'til you got the chance to read my words of wisdom, buy it now. (Who knows, I might influence some poor individual.)

Surviving adventures

While arcade conversions, and generally anything along alien/commie blasting lines, remain popular and the standard continues to rise, adventures have had a hard time. Many adventure columns have been wound down, and few software houses will market 8-bit adventures, quite simply because they're not commercially viable.

'Tis a pity, because adventuring is great fun. If you are one of those people who dismiss it all as pixie-bashing in the mystic land of Tharg, shame on you! The genre's come on a long way since *The Hobbit*, thanks mainly, of course, to the sterling work of Delta 4, Level 9 and St Brides, although more recently the independent sector has taken over.

Operating from back bedrooms and programming with an adventure writing utility such as *The Quill*, *GAC* and *PAW*, loads of small adventure producers have sprung up. In the main, the quality of product is high. They really deserve more coverage.

Take *Jekyll and Hyde*, from a small publisher called The Essential Myth. It's a brilliant adaptation of Stevenson's classic gothic horror, played in the murky, fog-filled streets of London. The text descriptions are superb, worthy of Robert Louis himself. Write to them at **54 Church ST, Tewkesbury, Glos GL20 5RZ**. Prices are £7.95 for 48K, £9.95 for an enhanced 128K version and £12.95 for +3 disk.

Another 'indie' software house worth contacting is Tartan, at **61 Bailie Norrie Crescent, Montrose, Angus DD10 9DT**. Its games are of a consistently high standard.

If you really want to rediscover adventuring on your Spectrum, get hold of *Adventure Probe* magazine. It reviews practically every independent and commercial release. The price is £1.25, and it's available from **Maes Y Cwm, Llandudno, Gwynedd LL30 1JE**.

Budget brains

Now here's something to make 16-bitters sick. Players has just released *Powerplay* for the Spectrum at £1.99. It's a sort of *Trivial Pursuit* played between Greek gods originally written for the ST and Amiga, where it retailed for twenty-odd quid. It might not look quite so nice in monochrome, but I think I'd sacrifice that to save all that cash.

Also out from Players is *Into The Eagles' Nest*, a wartime *Gauntlet* clone which sold for a tenner a few months back. How time flies when you're saving money!

Robin Alway

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Cheats

Take out your new copy of *Empire Strikes Back*, load and start the game as normal and then hold down the keys L, B, M, N, J, SPACE, K. This will pause the game. Now press RUN/STOP to unpause the game and you now have infinite shields.

Here's another one of those keyboard cheats, but this time it's for *Marauder* from Hewson. Load the game as normal, and then hold down the keys SPACE, COMMODORE KEY, Q, Z to play the game without collisions.

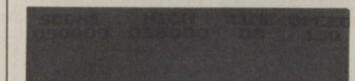
New stuff

Crazy Cars • Titus • £9.95cs, £14.95dk

Vrooom... The successful Amiga game *Crazy Cars* is coming to the C64 from Titus. You should know it by now, but just to refresh your memory...

You're in Florida (lucky you!), you have to get to Malibu, and all you have is a Porsche 911 Carrera to do it in. On top of that you don't have much time, so the race is on!

Mind you, even if you make it it's not over yet. You get whisked back to Florida and plonked in another car – a Lamborghini Countach this time – for another go, only this time you've got to do it even quicker. And watch out for the dips in the road. Succeed this time, and you go back to the start for your third and final challenge, this time in a Ferrari Testarossa. With three cars and various skill levels, you've got your work cut out.



Soldier of Light • Ace • £8.99cs, £14.99dk

The Taito arcade hit is here! As Xain, your mission is to rid the galaxy of all the Federation's enemies.

SOLDIER OF LIGHT
TAITO
ACE

Three planets in the sector have been invaded and the space between them infested with Federation attack craft. Tough stuff – but then you are equipped with armour, jet boots and armament pods.

Clear one planet and you then have to cut your way through enemy-infested space to the next. Time limits mean you can't stay too long on any one planet and, of course, by the time you've cleared the three planets, the Federation will probably have had time to invade at least one of them all over again.

If you get a chance to play the game, take a look at the credits (*That's enough free plugs – Ed*)...

```
1   B=49664
5   FORL=0TO47:READA:POKEB+L,A:NEXTL
6   POKE53281,0:POKE53280,0
7   REM ****************************
8   REM * DATA FOR SPRITE X PROGRAM *
9   REM ****************************
10  DATA 173,18,208,201,255
20  DATA 208,249,169,0,141
30  DATA 16,208,169,1,133
40  DATA 255,160,0,162,0
50  DATA 185,0,195,24,10
60  DATA 157,0,208,144,8
70  DATA 173,16,208,69,255
80  DATA 141,16,208,6,255
90  DATA 232,232,200,192,8
100 DATA 208,229,96
101 REM ****************************
102 REM * MOVE EIGHT SPRITES DEMO *
103 REM ****************************
110 PRINT"[CLR HOME]"
200 A=53249:B=0:C=0:FORL=0TO7:POKE49920+L,0:NEXTL
210 FORL=0TO7:POKEA+B,C:B=B+2:C=C+24:POKE2040+L,2:NEXTL
220 POKE53269,255
230 FORT=0TO25:SYS49664:E=1
240 FORL=0TO7:POKE49920+L,PEEK(49920+L)+E:E=E+1:NEXTL
250 NEXTT
260 END
```

Listing

The listing above can be very helpful when moving sprites left to right or in any formation. But does it ever annoy you that sprites have only 0-255 positions, allowing it only to reach 29 chars of screen?

Well the only way to get around this problem is to borrow a bit from $D010 which will reset the sprite into the next 255. But this can be a flickery task for Basic, so this routine will do it for you.

What it does

It takes the normal sprite position number (from 49920-49927) and doubles the result. The result is then placed into the original sprite location (at 53248+) and then checked to see if the number doubled bigger than 255. If it did then the program will automatically enter it into the next 255. This also gives the sprite an eight bit "X" co-ordinate.

The only disadvantage is that the sprite will now move two pixel positions instead of one.

Your normal Basic program can continue from line (101). Each time you move your sprite you must have the line "SYS 49664" at all times in the loop to sort out the eight sprites.

You must remember that the sprite "X" positions are now "49920-49927" instead of (53248-53262). The "Y" co-ordinate of the eight sprites is still:

(Y)		(Y)	(X)		(X)
53249	(1)	SPRITE	49920	(1)	SPRITE
53251	(2)	SPRITE	49921	(2)	SPRITE
53253	(3)	SPRITE	49922	(3)	SPRITE
53255	(4)	SPRITE	49923	(4)	SPRITE
53257	(5)	SPRITE	49924	(5)	SPRITE
53259	(6)	SPRITE	49925	(6)	SPRITE
53261	(7)	SPRITE	49926	(7)	SPRITE
53263	(8)	SPRITE	49927	(8)	SPRITE

Ian & Mic

CPC centre

A Christmas appeal

Christmas is a time for giving. A time for sharing. A time for thinking of those less fortunate than yourselves. Like all those software houses so desperate for friends and folding money that they are forced in sheer desperation to relive past glories and flood the shops with their old hits.

Who's bad?

Noticed just a hintette of editorial sarcasm in last week's column. So headless chickens don't run around signing contracts, eh? Well of course not; they donate material into the public domain, which is why everybody knows at least one chicken joke (and also why the public domain is full of chickens– I think I hear the editor). And heartfelt thanks, while we're at it, to the five readers who all wrote in to remind me that the difference between Warhammer and Warhammer 40,000. One, apparently, is set on a fantasy middle age hero-breeding planet called the Old World. The other, er, you guessed...isn't.

Scrooges among you – and judging by your letters, there may be one or two – will protest: "*Compilations? Bah humbug! Pass the gruel, Alice! Nothing more than a blatant attempt to cash in on people's gullibility and frantic desire to get the presents problem sorted with the minimum of fuss!*" But don't be too hard on them – and stop talking in italics. After all, what would you do in their shoes?

Let's look at one or two of these broken down old figures, shambling along the high street muttering, "Solid gold, spare twenty pence guv, they sold a million, greatest hits, as seen on TV, didn't you kill my brother?"

Giants, US Gold's tug at your heartstrings, for example, is seriously mistitled. People with a Distinct Disadvantage in the Height Department would be nearer the mark. You get four clapped out old winos – *Rolling Thunder*, *720°*, *California Games* and even the wretched *Out Run* for heaven's sakes – and one chap still managing to hold down a full-time job, *Gauntlet II*. Honestly, does US Gold have nothing better to offer in exchange for a bit of seasonal warmth?

Gremlin is relying for its Christmas dinners on *Flight Ace* and *Space Ace*. The former has two real crackers – *Advanced Tactical Fighter* and *Tomahawk* – and four less than mind-blowing repeats in *Strike Force Harrier*, *Ace*, *Spitfire 40* and *Air Traffic Control*.

Space Ace, meanwhile, presents seven retreads of varying quality. *Cybernoid*, *Trantor* and *Exolon* are well worth anyone's Christmas tokens on their own, while *Venom Strikes Back*, *Xevious*, *Northstar* and *Zynaps* are by no means turkeys.

Finally there's Ocean's not very imaginatively entitled *Game, Set and Match II*. The star performer without any doubt, Brian, is the superlative *Matchday II*, and even cynical old hack Private I ("one way ticket to the machine specifics" indeed!) would have to admit that the rest aren't that bad either. *Championship Sprint*, *Track and Field*, *Steve 'Interesting' Davis Snooker*, *Super Hang On*, *Ian Botham's Test Cricket*, *Nick Faldo Plays the Open*, *Ian Botham Cracks a Few Heads Open*, and *Basket Master* – all this for little more than the price of *Trivial Pursuits*? Can't be bad.

Still, though you may find it hard to believe, these sorry characters were once the life and soul of the party. They, like you, can remember a time when everyone told them they were games in their own right, when they even featured in people's "Top Ten" lists. Give generously. Remember, there may come a time when you too are no longer needed. Send what you can afford, please, however small, to Gremlin, Ocean or US Gold. Thank you so very much.

Not our type of game

Oh dear, oh dear, oh dear. The latest in a very long line of at best average arcade conversions is Electric Dreams' mediocre *R-type*. The arcade original had huge and brilliantly colourful sprites, superb sound effects and furious action. The CPC version, by contrast, is a tediously slow game with lousy graphics and feeble sound. Everything the original had going for it, in fact, has disappeared. Well blow me, what a surprise, you could have knocked me down with a freelancer's cheque. I suppose I should be too old and perhaps even a bit too wise to be disappointed by such things any more, but I know one thing: if I was an arcade fan who bought this at £15 expecting something good, I'd be bitterly disappointed. Angry even.

Stupid cut

Strolling past Dixons the other day on my way to a liquid lunch, I noticed the change to the Amstrad logos on the CPCs. The interesting thing, though (*Thought you'd never get to that bit – Ed*), is the price tag. The 464 (nostalgic sigh) is on offer at £159/£259 – i.e. £40 under the odds. Add this to the Comet's £50 off the 6128, which I mentioned last week, and it begins to look like a general price cut that isn't official...

• Giants – overstating it just a bit, perhaps?

How very like Amstrad! It could have made quite some mileage out of it if only it'd done it noisily. The CPC, as I need hardly remind you, is by no means 'just' a word processor, nor 'merely' a comms computer, nor indeed a straighforward games machine. It's all three. Compared with other machines, with their small spectrum (!) of owners huddled round a central theme, the wonder is it hasn't been more successful.

The key is undoubtedly its price tag. Sugar doesn't go in for price cutting – it's one of the few things beneath him (the others are – oh, never mind). But this vicious consumer Christmas is one long and bloody battle for the number one selling computer. I doubt if the market has ever been more crowded or more cut-throat.

In the present climate, and despite this fumbled attempt at a price cut, the CPC is looking a bit adrift.

Steve Carey

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PCW PATCH

Let there be lightning

Graphics have never been the PCW's strong point. We're writers and thinkers, dammit, not games players! You can tell by the rejection slips sticking out of the top pocket.

The lack of routines in *Mallard BASIC* to plot pixels on the screen, draw straight lines, fill shapes and move sprites means writing your own arcade conversion can be tricky. You end up with versions of *Afterburner* in which you, the letter Z at the bottom of the screen, fly around shooting letter Xs at enemy craft, represented by $ signs.

Double or quits

Ever wanted to emphasise your headline WHY DISC CASES ARE NOT NECESSARY with more than boring old underlined double size 10 pitch bold italic?

Here's how to double-underline in LocoScript 2: after underlining as usual, at the end of the line put a (+LS12) code followed by [RETURN] and, on the next line, as many dashes ([ALT] hyphens) as there are characters in the headline. Reset the spacing to normal with a [RETURN] and (-LS) and on you go.

Lightning BASIC from CP Software (0993 82 3463) gives you all the routines that *Mallard* lacks. For £24.95 you get the functions above plus user-definable graphics, alternative character sets and screen saving. You lose a few K of workspace but conveniently can use the routines in programs you write for commercial sale.

Now there's a new version, *Lightning BASIC Plus*, which also runs CP/M programs from within BASIC (SETKEYS, for example), promises multiple sprites and four tone colour! (So 8000 owners can vary their diet of greens with light lime green, pale lime green and pastel lime green).

File bodies

LocoFile, the card index database that works from inside *LocoScript 2*, is now out after a short delay for bug fixing. A few new features have been slipped in to the already impressive spec including the ability to sort on dates.

One option lets you sort on birthdays. Now not only can you remember your partner's birthday or the anniversary of your mortgage, you can sell them life insurance and pension renewals too.

Green light

While the evil capitalist World Banks cripple the earth's lungs by encouraging Brazil to turn rainforests into car parks, PCW owners squander the little remaining woodland by sending mail shots to all sixty thousand of their club members. But now, at last, environmentally conscious Amstradders can send newsletters to everyone with a clear conscience. Recycled fanfold continuous paper is available from **Traidcraft plc, Kingsway, Gateshead, Tyne & Wear NE11 0NE**. Price £4.95 for 500 sheets.

Rob Ainsley

QL corner

PC emulator

The software scene for the QL has been set alight with Digital Precision's announcement that it has completed work on a full-scale, high-specification PC Emulator. I am now at liberty to release some details.

Basic converter

PDQL is offering a SuperBASIC to C converter.

There are almost certainly restrictions relating to the quality of the SuperBASIC source (garbage in, garbage out), but then if you want to work with C (not the friendliest language for debugging) you are unlikely to have written crappy BASIC in the first place.

At just £49.95 this program must be an excellent buy. Its author, Chas Dillon, is one of the most brilliant programmers on the QL (his works include a host of Archive utilities, XREF, THE EDITOR – and he was a member of the team of four who produced TURBO), so we can expect super quality. PDQL are at Unit 1, Heaton House, Camden St, Birmingham B1 3BZ. Tel: 021 200 2313.

For those of you for whom the significance of this product is not immediately apparent, it transmogrifies the QL into a PC-compatible machine (except for a few niggles in the way of hardware, add-on cards and games that make calls directly to hardware addresses, something which 'serious' programs don't do) at a tiny fraction of the cost of a PC (around £100 is expected – but Precision has been hinting that the product will come in two 'flavours' – we will have to wait and see what it means!).

Betatest copies of this product – which Precision calls THE SOLUTION – have been out for a while now, and reports are most encouraging. If it's finished, why doesn't Precision release it?

A January launch is expected, while Precision completes negotiations with Microsoft for a bundled version of DOS (*The solution* will be available without a DOS as well) that is apparently more recent than *v3.3*... The saga continues next week.

Sector selection

Sector Software (**32 Wray Crescent, Ulnes Walton, Leyland, Lancs PR5 3NA**. Tel: 0772 454328) is a reliable QL organisation with a good reputation for sensible, middle of the road, reasonably priced products.

Fairly recently it has come out with a program which gives *Quill* graphics (it's called *Overdrive* and costs £16) and some accessories for *Page Designer 2*, namely *Image Processor* and *Omnidump*. We look forward to pitting *Omnidump* against *GrafiX* from PDQL.

Sector's software seldom disappoints, and *Flashback*, its ultra-fast information storage and retrieval system (a database by any other name) really does work and – just as important – really does exist. Do I hear whispers about *Quickfax*? A good deal of noise was made about it almost a year ago, but neither hide nor hair of it has been seen as yet. Somehow, I don't think Sector Software has to worry about slofax. Remember the *Futura*?

Next week

We ask "How good is the QL...?"

Eric Simmonds

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BEEB BOX

Basic options

BBC Basic has many advantages; it is fast and powerful, gives control over many features of the machine, and many owners become quite simply addicted to its elegance and functionality.

It does, however, have two major disadvantages. It is not compatible with the Microsoft standard, and is unique to the Beeb.

> ### Superior releases
>
> ***An as yet unconfirmed rumour suggests that Superior Software is springing some new games onto the Christmas market. The most interesting is a Question of Sport simulation, while we may also at last see Galaforce 2. Definitely available, though, will be Ninja Warrior.***

It now seems unlikely that the former problem will ever be addressed, but several companies have been vigorously tackling the latter. One of these is M-Tec, which has recently announced *BBCBASIC PLUS* (£86).

This mouthful is a version of your favourite Basic that runs on IBM PCs and compatibles. It is aimed at mixed PC/BBC environments, such as schools, and comes complete with such features as copy key editing. I had the earlier version installed on an Amstrad, and taking it out for a quick look reminded me of how unsophisticated it felt on a PC. On a Beeb it fits like a well-worn glove, yet in comparison with Borland's *Turbo Basic* it suffers badly. Perhaps that's unfair, but these days one expects more for the money (£96.60).

The program also supports in line assembler, and as with the Model B it may be the best way of learning assembly language programming without all the normal hassle involved. I will reserve final judgement until I have actually seen the product with its new features, including Mode 7, full 640K memory support, new graphics, and (praise be!) full screen Editor.

Another product you should purchase with the above is *BEEBdos* from Microboss. This is a suite of programs that mimic your BBC's DFS on a PC or compatible, allowing you to read and write BBC disks, copy files and so on. One word of warning – the disk formats supported depend on DFS being installed, otherwise recommended.

Mac screen mystery

As this seems to be BBC meets other machines week I will go on to lay down a challenge to Apple computers. When you next show a BBC and a Mac side by side in your educational brochure, could you please let us see what a Mac screen actually looks like? The stripped-in screen printed really doesn't look very lifelike. When I called Apple asking for a comment, the people concerned were said to be "Out to lunch" at a quarter past twelve.

No escape

Many thanks to the reader signing himself "M" for his tips, including *FX229,0 to turn off the ESCAPE key in your programs.

Andrew Brown

MSXTRA

Huge compilation

Nightdare Ltd, a company which specialises in MSX, has just sent me a new list of hardware and software. It is the software list that makes the most interesting reading.

It includes a compilation of MSX games. Its 33 (!) titles are mainly arcade games from the Dutch company Aackosoft. What is surprising is the fact that the games are available on three formats – tape, 3.5" disk and COMPACT DISC. Yes, you did read that properly, I did say CD. I have always believed that CD was the ideal medium for software storage, but didn't believe the good old MSX would be one of the first in the UK to release games software on this format. Let's hope we see many more titles presented this way. The price of the compilation for the various formats is as follows:

Cassette £22.95 • disk £24.95 • CD £29.95.

So although CD is dearer, you have still paid less than a pound a game.

Star Wars

Still with software, Domark has finally released *Star Wars* for the MSX, a game I always enjoyed, priced at £9.95. It is rumoured that it is also converting *The Empire Strikes Back* to MSX – I hope so, as it was well-received on other formats.

Gold bombs out

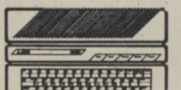
I have now had the opportunity to evaluate the MSX version of *Psycho Pigs UXB*, one of US Gold's latest releases.

Alas I hate giving bad reviews, especially as the MSX is the poor relation when it comes to the quantity of software available, and we should be glad of US Gold's continued support.

However, I just can't see how anyone could enjoy playing such a simple game. All you do is pick up a bomb (its detonation time is written on it), throw it at the other pigs on screen, and try to avoid being blown up yourself. Oh yes, there is a bonus screen where you have to run around like a madman (madpig?) trying to kiss the sows as they pop up and down. To say boredom (*boardom* – geddit?) set in after only a few minutes' play is putting it mildly.

> ### MSX 2+ specs
>
> ***At last I have the specifications of the MSX 2+. Firstly, it still uses a Z80 main processor, but also uses side ROM, giving the main chip less to do. Secondly, there is a minimum 80K ROM. The minimum RAM is specified at only 64K, but so far all the computers in Japan have at least 256K RAM. 128K video RAM is included, as is an 8-octave FM stereo sound chip. It is also possible to have 64 flexible waveforms.***
>
> ***Resolution includes all MSX 2 modes, plus a 512 x 424 resolution. 19,268 colours are available on-screen. The 2+ also has built in vertical and horizontal scrolling – always poor on the MSX 1 – and all machines have a 3.5" disk drive built in. All software for the MSX 2+ will be on disk, due to the chip shortage, I believe.***
>
> ***Will we get the 2+ in Europe? The Japanese say they have no plans for a European launch, but then they said that about the MSX 2.***

Keith Neal



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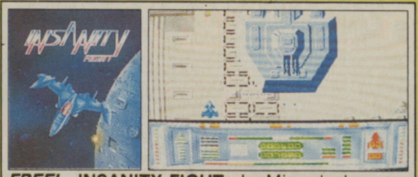
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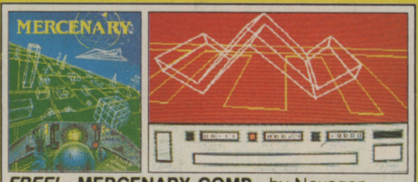
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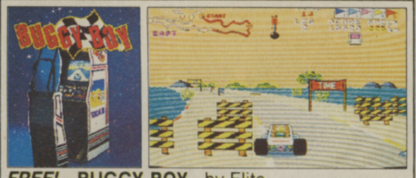
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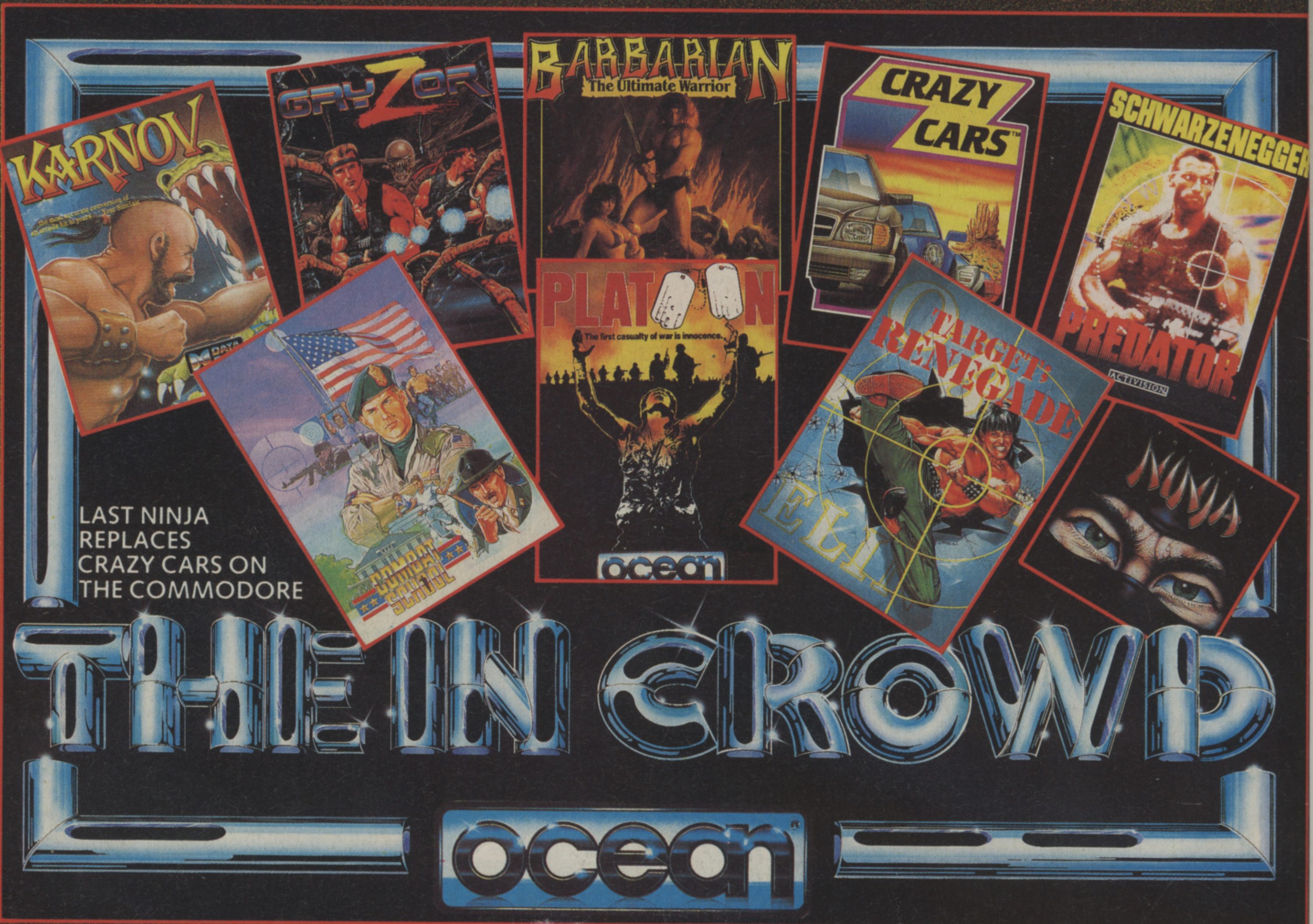

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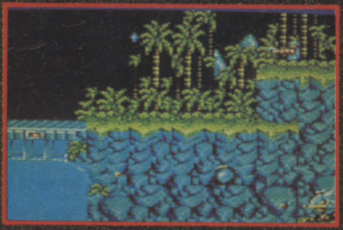

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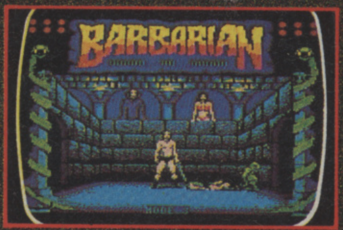

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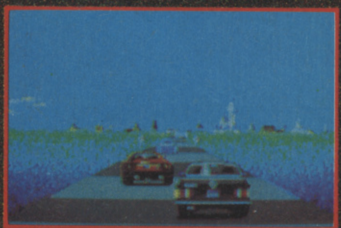

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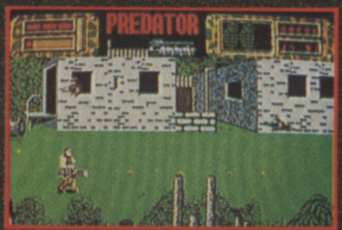

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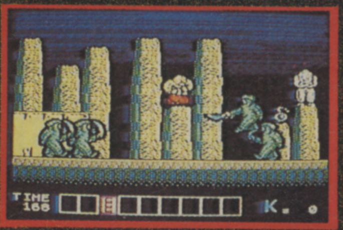

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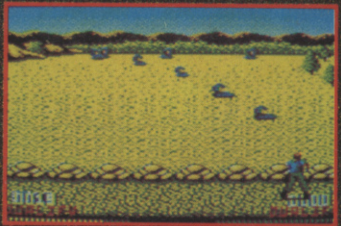

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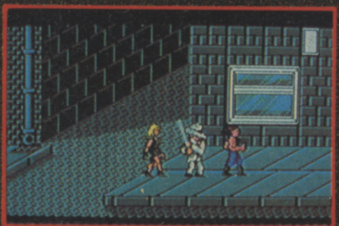

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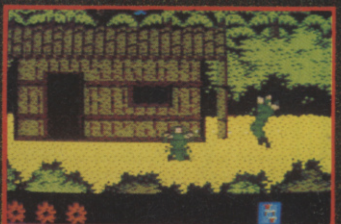

PLATOON Lead your Platoon deep into enemy territory, you can almost feel the humidity, sense the threatening dangers as you encounter the enemy and his many booby traps. Having found the underground maze of tunnels, enter at your peril! Enemy soldiers lunge at you from the murky waters within, but this is the only way you can find vital information. If you come out of this alive, you'll be just one of the few!
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